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ROENTGENOGRAPHIC STUDIES OF THE URINARY TRACT DURING AND AFTER PREGNANCY

STANLEY R. WOODRUFF, M.D.
JERSEY CITY, N. J.
AND
ARTHUR H. MILBERT, M.D.
NEW YORK

Urographic study of the upper urinary tract in pregnancy has been the subject of several recent contributions to the literature. Our present purpose is to review briefly the various salient features already stressed and add several of our own concepts, gained from a study of sixty consecutive unselected normal pregnancies. In limiting our study to intravenous or excretory urography, it was intended to investigate the physiology of the upper tract free of any mechanical intervention. Particular attention was placed on studies taken with the patient in the upright position, since it is our belief that renal mobility and nephroptosis is a vital factor in predisposing to complications.

Patients were taken as they presented themselves at the antepartum clinic of the Bayonne Dispensary. Each had been investigated from a medical and an obstetric standpoint and was apparently normal. Urinalysis in each instance was likewise free of pathologic conditions. The stage of pregnancy when first seen varied from one month to nine months.

In all patients a preliminary plate of the abdomen was taken prior to the injection of 20 cc. of diodrast. Radiographic exposures were then made in the supine position at five, thirty and sixty minute intervals, while an upright exposure was made at the end of fifteen minutes (figs. 1 and 2). Maximum excretion of the dye was most often noted at the end of thirty minutes, although the majority of the five minute exposures showed well delineated pelves. Definition in most of the plates was somewhat obscured by the increased density and depth of penetration necessary. We feel that this is a vital factor in the apparent delay in excretion of the dye during pregnancy.

When possible, excretory urography was carried on at monthly intervals. In several instances five studies as outlined were obtained during the antepartum and postpartum investigation of the patient. The pregnant woman was found to tolerate the injection well, and no apparent ill effect was noted on the fetus in utero or the newborn, either from the drug or from the exposure to roentgen rays.

From the Department of Urology, Bayonne Hospital.
Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

An interesting problem arises in connection with the use of a complex halogen and the roentgen ray during pregnancy. Does diodrast or a similar preparation reach the fetus through the placental circulation? Is there any danger of iodism in the fetus if such transmission does occur? May it be possible by refined radiographic technic to show the presence of dye in the urinary tract of the fetus during the final months of pregnancy? It is known that the fetal kidneys function during the last few months of pregnancy.

Further, what effect does the brief repeated exposure to the roentgen rays durjng the course of one or more excretory urograms have on the mother and fetus? In some instances, owing to the need for depth of penetration, an exposure time of four seconds was necessary. Scrutiny of the various contributions in the past has not considered this very vital problem.

Miller, Corscaden and Harrar,[1] after surveying the literature on the effects of radiation on the human offspring, conclude that "it seems reasonable to advise that the use of radium and x-ray during pregnancy for treatment purposes be restricted to very clear and urgent indications, and that the use of diagnostic x-ray examinations be not too frequently repeated during pregnancy." While superficial investigation may reveal no apparent immediate ill effects from the radiographic exposures experienced by these pregnant women, who knows the far-flung late sequelae of such a powerful physical agent?

ETIOLOGY OF DILATATION

The characteristic dilatation of the upper urinary tract during pregnancy was noted almost a century ago by Pierre Rayer,[2] who commented on the finding at autopsy and the frequency with which it was associated with infection. Undoubtedly many of these cases presented an organic obstructive uropathy as a basis for their presence in the mortuary. In 1905 Opitz[3] expounded the hypothesis that such dilatation was due to compression of the ureters by the enlarging uterus at the pelvic brim.

Since Opitz's time numerous observers have offered further explanation for the ureterectasis and pyelectasis of pregnancy. His mechanical theory has been corroborated by other writers. Schumacher[4] advanced the explanation that dilatation is due to compression of the hypotonic ureter between the posterior wall of the uterus and the belly of the psoas. Carson[5] made the

1. Miller, J. R.; Corscaden, J. A., and Harrar, J. A.: The Effect of Radiation on the Human Offspring, Am. J. Obst. & Gynec. 35:318 (March) 1938.
2. Rayer, Pierre: Maladies des reins, 1841.
3. Opitz: Pyelonephritis of Pregnancy and Puerperium, Beitr. z. Geburtsh. u. Gynäk. 9:209, 1905.
4. Schumacher, Paul: Ergebnisse der intravenösen Pyelographie und radiographischen Sublimatdarstellung der weiblichen Urogenitalorgane bei der Pyelitis graviderum, Arch. f. Gynäk. 149:(462), 1931.
5. Carson, W. J.: Ureteral Dilatation of Pregnancy, Autopsy Findings, J. Urol. 16:167 (Sept.) 1926.

observation on postmortem examination that the sigmoid forms a cushion for the left ureter. That the right ureter is impinged on by torsion of the gravid uterus was demonstrated by Baker and Lewis,[6] who combined barium sulfate enema studies on the colon with their excretory urographic observations. In this way the right-sided preponderance of dilatation of the urinary tract finds an apparently logical explanation.

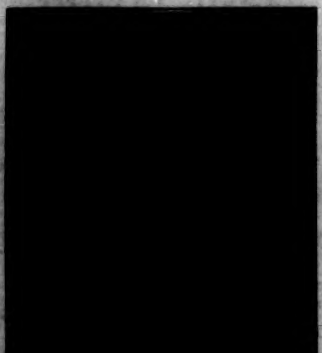

Fig. 1.—Exposure in supine position thirty minutes after injection. Patient was 5 primipara in the seventh month of pregnancy. Note dilatation of calices, pelves and ureters with bilateral angulation of latter.

Baker and Lewis, as well as Kretschmer and Kanter,[7] have studied the effects of other pelvic masses in the nonpregnant woman on structure of the upper urinary tract. Such pathologic conditions as fibroids, ovarian cysts and other pelvic tumors, when strategically exerting pressure at the pelvic brim, showed characteristic dilatation of the upper ureter and pelvis, the extent and location of the lesion on the urinary tract depending on the location of the tumor and its site of greatest pressure. Both groups of observers concluded that the mechanical factor involved in these conditions mimic the situation existing during pregnancy.

Traut and McLane[8] have shown that pregnancy alters the rhythmic peristaltic action of the ureter and that, beginning in the third month of pregnancy, a diminished amplitude of this peristaltic wave occurs, reaching its peak in the seventh month. They feel that dilatation is secondary to atony and that the etiology of the latter lies in some unexplained chemical basis rather than on any mechanical factor.

In a study of the structure and function of the ureter during pregnancy, Hofbauer[9] noted an increase in bile salts attended with hypertrophy of the lower ureters. He demonstrated fibrosis and muscular hypertrophy in the lower ureteral segment, attributing the dilatation above to it. Hundley and his associates[10] made the same observation after anatomic and histologic study of the urinary tracts of thirteen women who died during pregnancy or at term. They found marked hypertrophy of the external longitudinal sheath of Waldeyer encasing the lower end of the ureter. They also expanded on the work of Lee and Mengert,[11] who performed ureteral catheter drainage on pregnant women for twenty-four hours and noted little effect on the dilatation. As a result, the latter workers concluded that the dilatation was due to some cause other than mechanical blockage. Hundley, however, wisely effected drainage for forty-eight or seventy-two hours and noted a decrease in the dilatation.

The adherents of the hormone theory claim that estrogen produces muscular hypertrophy and vascular changes while the luteinizing principle, by its relaxing influence, leads to increasing atony of the ureter. If such is the case, why is it that the degree of dilatation varies so on the two sides of the same patient? Moreover, in almost all patients no visualization of the lower ureter was noted. Any substance acting systemically should produce the same uniform effect on the entire structure.

OBSERVATIONS FROM UROGRAPHIC STUDIES

In analyzing our series of sixty patients, the observations paralleled those of previous workers in the frequency of dilatation of the upper part of the urinary tract starting at the brim of the pelvis, in the predilection of such dilatation to the right side and in the outward bowing or displacement of the midportion of the ureters. In only four patients was the right

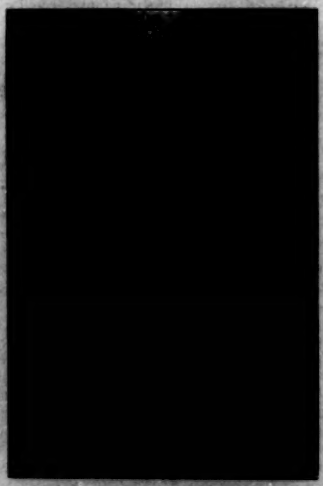

Fig. 2.—Upright exposure on same patient as in figure 1 fifteen minutes after injection. Note persistence of dilatation, nephroptosis and exaggeration of angulation of ureters.

6. Baker, E. C., and Lewis, J. S.: Comparison of the Urinary Tract in Pregnancy and Pelvic Tumors, J. A. M. A. 104:812 (March 9) 1935.
7. Kretschmer, H. L., and Kanter, A. E.: Effect of Certain Gynecologic Lesions on the Upper Urinary Tract, J. A. M. A. 109:1097 (Oct. 2) 1937.
8. Traut, H. F., and McLane, C. M.: Physiological Changes in Ureter Associated with Pregnancy, Surg., Gynec. & Obst. 62:65 (Jan.) 1936.
9. Hofbauer, J. L.: Structure and Function of the Ureter During Pregnancy, J. Urol. 20:413 (Oct.) 1928.
10. Hundley, J. M.; Siegel, I. A.; Hachtel, F. W., and Dumler, J. C.: Some Physiological and Pathological Observations on the Urinary Tract During Pregnancy, Surg., Gynec. & Obst. 66:360 (Feb. 15) 1938.
11. Lee, H. F., and Mengert, W. F.: The Effect of Pregnancy on the Urinary Tract, J. A. M. A. 109:162 (Jan. 15) 1934.

pelvis not dilated. The remainder showed pelviectasis and caliectasis varying between grade 1 and grade 4. Of these, thirty-eight showed grade 1 dilatation, ten grade 2, eight grade 3 and none grade 4. The left kidney pelvis was dilated to grade 1 eighteen times, grade 2 four times, grade 3 once and grade 4 not at all.

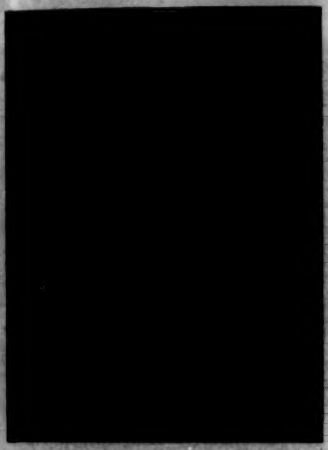

Fig. 1.—Supine exposure thirty minutes after injection of diodrast in multipara, aged 25. Note marked right-sided pyelectasis.

In studying the roengenograms and the constituent parts of the urinary tract, it was noted that the left ureter was more often dilated than the pelvis of the same side. The explanation of this phenomenon may lie in the fact that left-sided obstruction is less marked than that on the right side and the degree of obstruction is insufficient, or the exposure to such an obstruction is not long enough finally to affect the corresponding pelvis. This would further support the mechanical theory. Bowing or displacement of the ureters was noted in more than 50 per cent of the patients.

Postpartum check-up excretory urograms were done as a routine on the ninth day. This usually represented the day of the mother's departure from the hospital. Rather than risk loss of the case, we chose this early date for the determination of the status of the urinary tract in the postpartum period. In only 20 per cent of our series was subinvolution noted—even after nine days (figs. 3 and 4). It is unfair to consider a patient as presenting this condition on the basis of so short an interval, since others have not noted regression to normal configuration before four weeks has elapsed.

By some fortuitous circumstance, all our patients went on to uneventful delivery. None had to be hospitalized or treated from a urologic standpoint prior to delivery. Two points are clearly demonstrated by this record: First, most women without previous obstructive lesions in the urinary tract will go through pregnancy without any lasting damage to it; Second, the vast number of pregnant women who have serious dilatation and superimposed infection are suffering from aggravation of a condition which antedated gestation. Present knowledge of the havoc raised by ureteral stone, aberrant blood vessels, constrictions at the ureteropelvic and intramural portions of the ureter, new growths and congenital anomalies will explain, in our opinion, most instances of complications of the urinary tract in pregnancy.

Two terms often used—or misused—merit explanation. "Hydronephrosis of pregnancy" has been used to describe the condition of dilatation of the upper urinary tract during pregnancy. We do not favor the use of this term to describe a condition which, in the majority of cases, represents a transient and physiologic obstructive uropathy which returns to normal shortly after delivery. "Pyelitis of pregnancy" is another misnomer, for in practically all cases some organic obstruction is present, and infection is engrafted on the lesion (fig. 5). The systemic manifestations represent the effect of absorption of toxins from infected urine under pressure.

NEPHROPTOSIS IN PREGNANCY

Of particular interest to us was the study of renal mobility in pregnancy. Naturally we had no real criterion on which to evaluate the pregravid position and degree of mobility of the kidneys. In several cases the studies were started in the third month and in one we were fortunate in obtaining such studies in the first month of pregnancy, carried through a period of two and a half years.

Nephroptosis was found to exist in 25 per cent of our patients, varying from first degree to third degree. Those with the renal pelvis ptosed to a position opposite

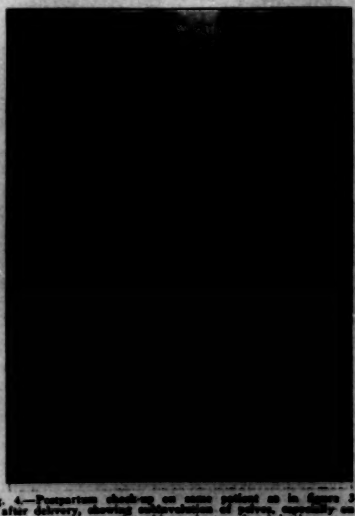

Fig. 4.—Postpartum check-up on same patient as in figure 3 nine days after delivery, showing subinvolution of pelvis, especially on right side, in supine exposure taken thirty minutes after injection.

the third lumbar vertebra were considered grade 1, those opposite the fourth lumbar vertebra grade 2, and those at or below the fifth lumbar vertebra grade 4.

We noted uniformly that, as gestation progressed, the degree of ptosis was lessened, the kidney being pushed up to practically a normal position by the gravid uterus. The benefit of this work of nature is readily apparent when one notes the exaggeration of the ptosis

in the postpartum period, once the supporting influence of the enlarged uterus is removed. Ureteral angulation is then intensified and a train of symptoms associated with obstruction and hydronephrosis follows.

In one instance, pyelographic study was made on a victim of nephroptosis in her first month of pregnancy (fig. 6). Her complaint at the time was dull persistent pain in the right loin. Neither the patient nor her doctor was aware of her pregnancy at the time. Second degree ptosis was diagnosed at this time and the patient continued with her pregnancy and was observed at intervals. Her ninth month urogram (fig. 7) showed only first degree renal ptosis (pelvis opposite third lumbar vertebra), obviously corrected by the upward push of the uterus. No ureteral kink was present.

The patient's postpartum upright urogram (fig. 8) showed a return to second degree ptosis, and two and a half years later she returned for relief of a gradually increasing right-sided discomfort, and the kidney was still ptosed to a position between the fourth and fifth lumbar vertebrae. Nephropexy was performed in this instance (fig. 9). This case graphically illustrates the fate of the kidney when it shows advanced mobility.

SUMMARY AND CONCLUSIONS

With excretory urography as a basis for investigation, sixty consecutive, unselected normal pregnancies were studied. Analysis of the urograms revealed observations that coincide with those of previous observers. Progressive dilatation of the upper part

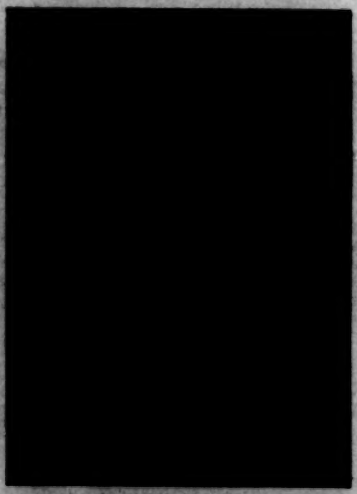

Fig. 5.—Retrograde pyelogram showing marked ureterectasis and lesser degree of pyelectasis in patient with organic ureteral (intramural) constriction. This patient, in her sixth month of pregnancy, displayed all signs and symptoms of so-called pyelitis of pregnancy.

of the urinary tract, more marked on the right side, with redundancy and lateral displacement of the ureters, was present in the majority of instances.

Special attention to renal mobility in pregnancy showed that preexisting nephroptosis was partially corrected during pregnancy but was exaggerated once the mechanical support of the gravid uterus was removed. Such abnormal mobility also predisposes to obstruction by angulation of the ureter. In an illustrative case traced from the first month of pregnancy through a two and a half year period, nephropexy was essential for relief of persistence of symptoms.

Our own feeling regarding the etiology of dilatation of the ureter and pelvis in the pregnant state is that the problem is chiefly a mechanical one.

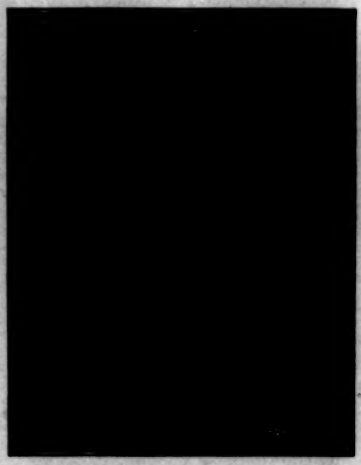

Fig. 6.—Upright exposure in a multipara, aged 24, in her first month of pregnancy. Note second degree right nephroptosis. Patient complained of right-sided dragging pain.

The terms "pyelitis of pregnancy" and "hydronephrosis of pregnancy" are considered misnomers. In the former, an infective process has been engrafted on some preexisting lesion, usually obstructive in nature, in the majority of instances. The latter term is a poor one to describe a condition which in the majority of instances represents an obstructive uropathy, transient and physiologic in nature, which returns to normal shortly after delivery. From our observations we would conclude that most pregnant women with no previous obstructive lesions will go through the period of gestation uneventfully, while those who do experience difficulty have had a condition which antedated gestation.

16 Enos Place—77 Park Avenue.

ABSTRACT OF DISCUSSION

Dr. Clarence G. Bandler, New York: The graphic presentation by Drs. Woodruff and Milbert clearly narrates the story of urographic studies during and after pregnancy. This demonstration, with the work of Hundley Jr., of Baker and of Lewis, impresses one with the rapidity of medical progress. The introduction of intravenous urography opened new fields for urologic endeavor, and, just as pediatric urology has expanded with this added impetus, so has the study of the urinary tract in pregnancy. Drs. Woodruff and Milbert have touched on a vital phase of the subject in their special attention to studies of the urinary tract in upright postures. I am well acquainted with the technic instituted by Dr. Woodruff and used by him for the past five years. One is apt to call any exposure taken with the cephalad portion of the body at an elevation of between 45 and 75 degrees an "erect exposure." This is of course

necessitated by the fact that some of the older cystoscopic tables could not be elevated higher. It is essential for proper evaluation of the position of the kidneys to make roentgenographic exposure with the patient in an erect position, his feet resting on the floor. For this purpose he leaves the table and takes a position in front of an upright movable Bucky diaphragm. In this way the natural mobility of the kidney is accurately evaluated, and the real degree of nephroptosis is ascertained. The authors have emphasized also a phase which has received no real consideration heretofore. The roentgen ray is a powerful agent and may be a very destructive one. In our enthusiasm let us not use it indiscriminately and without proper respect for the parts involved. To the urologist, the importance of such presentations as this is to show the apparent degree of urographic pathologic changes in asymptomatic, uneventful pregnancy. Opposed to the large group of normal pregnancies is the smaller one, in which, as Drs. Woodruff and Milbert have emphasized, a preexisting pathologic condition becomes subject to symptomatic exacerbation. Such illuminating reports as that of the authors stress further the need for close cooperation

Fig. 7.—Upright exposure in same patient as in figure 6 in ninth month of pregnancy. Note improved position of right kidney due to upward displacement by gravid uterus.

between the specialties of obstetrics and urology. A well trained urologist should be a valuable and active member of the staff of every obstetric service.

Dr. George Prather, Boston: Drs. Woodruff and Milbert have presented important data concerning anatomic changes in the urinary tract during pregnancy and the postpartum period. The dilatation of the upper part of the urinary tract, which at times develops to an extraordinary degree, is apt to be interpreted as a fundamental change needing surgical correction unless one is aware of the equally remarkable return to normal which occurs in the majority of patients. In the urologic department of the Boston Lying-in Hospital a considerable number of patients have pyelographic examination both during pregnancy and several months post partum. It is my impression that, while there is a prompt change after delivery, full recovery from the hydronephrosis and hydro-ureter of pregnancy is not accomplished until three or four months after delivery. Even after four months post partum, when, as seen by intravenous pyelogram, the calices have their normal cupping and the renal pelvis has returned to a normal size, it is possible to distend the kidney by a retrograde injection of 15 or 20 cc. of fluid without pain to the patient. Such a degree of distention would not be tolerated in a normal kidney which had never been associated with pregnancy. It is true that fundamental obstructing pathologic change in the nature of stones or aberrant vessels alters the progress of recovery, a fact which indicates the necessity of pyelograms three or four months post partum in cases of persistent infection of the urinary tract or other symptoms

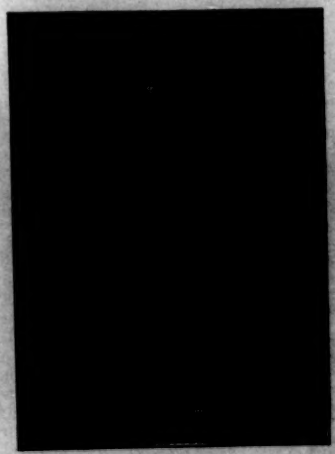

Fig. 8.—Upright exposure nine days post partum showing return of right kidney to second degree nephroptosis. Check-up after one and a half years later showed some retention with persistence of symptoms.

referable to the urinary tract. I do not believe that one should administer the high-powered urinary antiseptics of the present day to the patient with symptoms of long-standing duration unless one has satisfied himself that there is no anatomic patho-

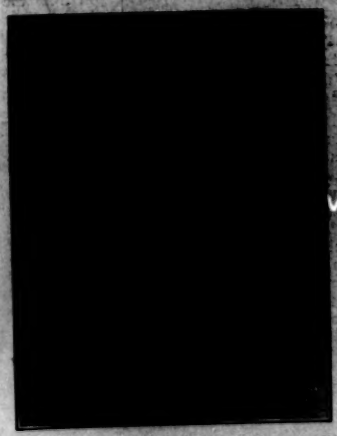

Fig. 9.—Upright exposure on same patient as in figures 6, 7 and 8 one month after right nephropexy for alleviation of symptoms. Note normal position of kidney. Clinically, the patient was symptom free.

logic change destined slowly to impair renal function. As long as one realizes that a four month period post partum is advisable before deciding whether surgical correction of hydronephrosis is necessary, the chance of performing unnecessary surgical operations is reduced.

APICAL LUNG TUMORS

FURTHER OBSERVATIONS WITH REPORT OF SEVEN ADDITIONAL CASES

JUSTIN J. STEIN, M.D.
HINES, ILL.

Malignant tumors of the thoracic inlet and pulmonary apex were first described under the heading of "superior pulmonary sulcus tumors" by Pancoast [1] in 1932. In 1924 he [2] first reported three cases in which certain characteristic conditions were present. At that time he referred to these cases as apical chest tumors. He later advised against the use of the name "apical chest tumor" as a designation for this type of growth, stating that it was confusing and that more common tumors would therefore be included under it.

The characteristic manifestations associated with tumors in the thoracic inlet as described by him were pain about the shoulder radiating down the arm, Horner's syndrome, atrophy of the muscles of the hand and roentgenographic evidences of a small homogeneous shadow at the extreme apex of the lung. Evidence of local destruction of ribs was always noted, and often infiltration into the adjacent vertebrae. Intrathoracic metastases were not noted. Pancoast did not believe that the tumor had its origin from the lung, pleura, ribs or mediastinum; in fact, he stated that primary lung cancer could practically be ruled out. He suggested an embryonal rest as an etiologic factor. His conclusions were based on a study of seven cases in the papers mentioned. Material for biopsy was obtained in only two and no postmortem examinations were made. The two specimens for biopsy were diagnosed as spinocellular carcinoma and metastatic carcinoma.

Fig. 1.—Appearance of chest in case 7? showing a tumor located in the right apex.

In 1937 I [3] presented a paper before the section on clinical pathology before the Texas State Medical Association, reporting eight new cases of so-called superior pulmonary sulcus tumors. My object in this paper is to present additional observations made on the outcome of these eight cases and also to report seven new cases.

REPORT OF NEW CASES

CASE 1.—*History.*—A white man aged 45, a postoffice employee, admitted to the hospital Aug. 19, 1937, had been in excellent health until three months prior to his admission. He stated that a cold developed accompanied by severe pain in the right upper part of the chest and shoulder region. The pain radiated down the right arm along the medial aspect to the wrist. There was marked weakness of the right arm and a loss of 20 pounds (9 Kg.). There was no history of cough, hemoptysis or night sweats.

Examination.—The patient was well developed and well nourished. Horner's syndrome was present on the right. There was some atrophy of the muscles of the right shoulder girdle, arm and forearm. A small node could be palpated just above the right clavicle. Examination of the chest revealed slight limitation of motion of the right upper part of the chest and dulness to percussion in the right apex. No rales were present. There was no alteration of breath sounds.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 80 per cent. Red blood cells numbered 4,280,000, white blood cells 9,200. Four examinations of the sputum for the presence of acid-fast bacilli gave negative results.

Roentgen examination revealed a well defined homogeneous density limited to the right apex. There was definite destruction of the medial portion of the third right rib at the costovertebral junction. An enlarged gland was seen in the right paratracheal region.

The clinical diagnosis was bronchiogenic carcinoma of the right lung, involving the upper lobe (Pancoast type).

Clinical Course.—The diagnosis was concurred in by Dr. Jerome Head, consultant in thoracic surgery, who recommended surgical exploration. September 23, posterior segments of the upper four right ribs were resected and an extrafascial apicolysis was performed. It was impossible to separate the tumor from the spinal column, and when the pleural cavity was opened the tumor was found adherent to the apex of the lung and to the necks of the ribs and spine along the mediastinum. It was impossible to remove it. Consequently the wound was closed with interrupted catgut sutures to the muscles and fascia and silk to the skin. Microscopic examination of a specimen of the tumor removed at the time of operation was diagnosed as carcinoma, squamous cell type, originating in the lung. Palliative irradiation was advised and the patient received a total of 1,200 roentgens to the right upper part of the chest anteriorly and 1,350 roentgens posteriorly. The patient received very little benefit from irradiation and was discharged from the hospital November 8. He died December 19. There was no autopsy.

CASE 2.—*History.*—A white man aged 50, a machine operator, was admitted to the hospital April 15, 1938, as a transfer patient from the U. S. Marine Hospital, Detroit. The patient stated that his general health had been very good until November 1937, at which time pain suddenly developed in his right shoulder, radiating down the inside of his arm to the elbow. There was some associated numbness and tingling in the third, fourth and fifth fingers of the right hand. There was some weakness of the muscles of the right upper extremity. He had lost 30 pounds (13.6 Kg.). There was no history of cough or hemoptysis. In December 1937 he went to the University of Michigan hospital, where a specimen was taken for biopsy from a node in the right supraclavicular region. He was told that he had a tumor and radiation therapy was advised. He received this at the Henry Ford Hospital, Detroit. There was very little relief from the pain in the shoulder region, which was sharp in character and occurred at irregular intervals.

Examination.—The right pupil was smaller than the left, and the right side of the face was not as moist as the left side. Ptosis and enophthalmos were not present. There was a firm tumor mass in the right supraclavicular region. There was marked weakness of the muscles of the right upper extremity.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 80 per cent. Red blood cells numbered 4,380,000, white blood cells 9,100.

Roentgen examination revealed a homogeneous density limited to the right apical region. Irregularity and narrowing of the superior margin of the posterior portion of the third right rib was noted. The right side of the chest was somewhat constricted.

Read before the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 13, 1938.

From the Tumor Clinic and Tumor Research Unit, Veterans Administration Facility. Published with the permission of the Medical Director of the Veterans Administration Facility, who assumes no responsibility for the opinions expressed or conclusions drawn by the author.

1. Pancoast, H. K.: Superior Pulmonary Sulcus Tumor, J. A. M. A. 99:1391 (Oct. 22) 1932.
2. Pancoast, H. K.: Importance of Careful Roentgen-Ray Investigations of Apical Chest Tumors, J. A. M. A. 83:1407 (Nov. 1) 1924.
3. Stein, J. J.: The Clinical and Pathologic Features of Tumors Occurring in the Region of the Apex of the Lung, Texas State J. Med. 33:293-299 (Aug.) 1937.

The clinical diagnosis was bronchiogenic carcinoma of the right lung involving the upper lobe (Pancoast type). A report of the biopsy done at the University of Michigan Hospital was medullary carcinoma.

Clinical Course.—Since the condition was considered to be of a palliative nature, further irradiation has been recommended. At the present time the patient is receiving radiation therapy. However, there has been no improvement in his clinical condition. He is remaining in the hospital for further observation.

CASE 3.—*History.*—A white man aged 40, a salesman, admitted to the hospital March 4, 1937, had been in good health until Nov. 1, 1936, at which time pain developed in the left knee and extended down the left leg. In December 1936 he was confined to bed because of severe pain in the entire lower left extremity. A specimen was taken for biopsy from the left femur in a private hospital and a diagnosis of osteogenic sarcoma was made.

Examination.—The patient was well developed but poorly nourished and appeared chronically ill on admission. Examination of the left lower extremity revealed no palpable enlargement. There was a scar over the anterior aspect of the thigh, which was healed.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 75 per cent. Red blood cells numbered 4,240,000, white blood cells 12,100.

Roentgen examination revealed an area of destruction in the upper portion of the shaft of the left femur, the appearance of which was suggestive of a primary bone sarcoma. Roentgen examination of the chest revealed a faint infiltration in the right infraclavicular region, which was probably the residual of an old inflammatory process.

From the biopsy at the private hospital the diagnosis of osteogenic sarcoma was made. Therefore the clinical diagnosis was osteogenic sarcoma of the left femur.

Clinical Course.—April 15, 1937, disarticulation of the left hip joint was done. The patient's postoperative condition was good and convalescence was uneventful. He was discharged August 3. He was readmitted Jan. 19, 1938, with a history that his condition had been good until October, at which time severe aching pains developed in the right shoulder region. The pain would radiate down the right arm to the elbow. Roentgen examination of the chest revealed a dense homogeneous shadow occupying the right apical region. A postoperative diagnosis of osteogenic sarcoma of the left femur with metastasis to the right apical region was made. No changes in the bony framework of the chest were noted. Many examinations of the sputum for acid-fast bacilli were negative.

Although the patient did not present Horner's syndrome, he had severe pain in the shoulder girdle with radiation of the pain into the arm, which is characteristic of an apical tumor. It is quite possible that, if he should be followed over a period of time, Horner's syndrome and possibly changes in the ribs might be observed. The patient received radiation therapy without any relief of the pain. He was discharged March 15, 1938, with the disease in a terminal condition.

CASE 4.—*History.*—A white man aged 37, a railway express agent, admitted to the hospital April 9, 1931, stated that he had been hoarse for approximately eight weeks prior to admission. He also complained of severe pain in the region of the left upper part of the chest. There was also a rapid loss of weight and strength, especially of the left upper extremity.

Examination.—There was a typical Horner syndrome on the left, namely miosis, anhidrosis, ptosis and enophthalmos. Examination of the larynx revealed the left vocal cord to be tense, somewhat thickened posteriorly and fixed in abduction by scar tissue. There was no evidence of any growth or active inflammation. Examination of the chest revealed dulness to percussion anteriorly and posteriorly at the left apex.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 50 per cent. Red blood cells numbered 2,800,000, white blood cells 10,300. Numerous specimens of sputum were examined for acid-fast bacilli; however, none were found.

Roentgen examination revealed a homogeneous density involving the left apical and infraclavicular regions. There was a slight erosion of the third left rib in the posterior axillary line. There were scattered spherical densities in the parenchyma of the left lung and also enlarged nodes in the left hilus.

A clinical diagnosis was made of bronchiogenic carcinoma involving the upper lobe of the left lung with metastasis throughout the left lung.

Clinical Course.—The patient was quite ill during his period of hospitalization. Aspirations of the left side of the chest were made on several occasions and blood-tinged fluid was obtained. Examinations of the fluid for acid-fast bacilli were negative. The patient's condition became rapidly worse and he died June 2. Permission for autopsy was not granted.

This case is quite interesting in that intrathoracic metastases were present. This is the first case of this type to be reported in which intrathoracic metastases were found. Repeated examinations were made in an attempt to locate a primary lesion which would account for the pulmonary changes in this case. However, none was found, and it was therefore concluded that the tumor in the left apex was the primary lesion and the small spherules scattered throughout the left lung were considered as metastatic lesions from this left apical tumor.

Fig. 2.—Appearance of chest in case 19 showing a so-called superior pulmonary sulcus tumor in the right apex.

CASE 5.—*History.*—A white man aged 40, a chauffeur, admitted to the hospital April 26, 1938, until four months prior to his admission had been in excellent health except for a chronic cough which recurred each winter. Approximately four months before admission a severe, aching pain developed in the left arm and radiated down the inner aspect of the arm and forearm into the ring and little fingers of the left hand. The pain was quite severe and required narcotics to give relief. The pain was associated with dyspnea, cough and expectoration. The patient was hospitalized in a private institution, where a diagnosis of tuberculosis was made. Later, because a malignant condition was suspected, he was transferred to this hospital. There was considerable loss of weight and also loss of strength, especially of the left upper extremity.

Examination.—The patient was poorly nourished, appeared dyspneic and slightly cyanotic, and was acutely ill on admission. Horner's syndrome was present on the left side. There were several firm nodes present in the left lower cervical region. Examination of the chest revealed diminished expansion on the left side and also dulness at the left lower base. There was marked weakness of the muscles of the left upper extremity.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 80 per cent. Red blood cells numbered 4,250,000, white blood cells 25,700.

Roentgen examination revealed a homogeneous density in the left lung near the apex. There was a hydropneumothorax at the left base. There was no evidence of erosion or destruction of the bony framework of the chest.

The clinical diagnosis was bronchiogenic carcinoma of the left lung (Pancoast type) with metastases to the left supraclavicular region.

Clinical Course.—It was necessary to perform aspirations of the chest because of the marked dyspnea caused by the pleural effusion. Bloody fluid was obtained on several occasions. Examination of the fluid did not reveal the presence of organisms. The patient's condition became rapidly worse and he died April 29.

Autopsy.—This revealed a carcinoma involving the apical portion of the left lung with metastases to the left supraclavicular region, left pleura, right lung, diaphragm, liver and mediastinal and abdominal lymph nodes. Histologic diagnosis was carcinoma of the lung, undifferentiated type, with areas simulating adenocarcinoma.

Case 6.—*History.*—A Negro aged 53, a cook, admitted to the hospital Jan. 27, 1938, had been in good health until April 1937, at which time pain suddenly developed in the region of the left shoulder. The pain was sharp in character, occurred at irregular intervals and radiated down the left arm as far as the wrist. Since the onset of the pain he had gradually noticed weakness of the left upper extremity. Loss of weight was approximately 25 pounds (11.3 Kg.). He was told by a private physician that he was suffering from neuritis. About two and one-half months prior to his admission he first noticed a mass in the left supraclavicular region. At approximately the same time he noticed absence of sweating on the left side of his face. There was no history of cough. Slight hoarseness had been present for approximately three months.

Examination.—The patient was critically ill on admission. There was a typical Horner syndrome present on the left. There was a healed scar in the left supraclavicular region. Also a firm mass could be palpated in this region. There was atrophy of the muscles of the left shoulder girdle. The left apical region was contracted when compared with the right. There was marked weakness of the muscles of the entire left upper extremity.

Urinalysis was essentially negative except for occasional red blood cells. The Wassermann and Kahn reactions were negative. The hemoglobin content was 80 per cent. Red blood cells numbered 4,250,000, white blood cells 6,200.

Roentgen examination revealed a homogeneous density occupying the left apical region. There was slight narrowing of the intercostal spaces on the left. No costal changes were noted. There was a large node in the left paratracheal region.

The clinical diagnosis was carcinoma of the left lung (Pancoast type) with direct extension to the left supraclavicular region.

Clinical Course.—A review of the biopsy on material taken from the left supraclavicular region prior to the patient's admission to this hospital revealed a diagnosis of adenocarcinoma of the lung. Radiation therapy was recommended. However, the patient died February 21, before the treatment could be completed.

Autopsy.—There was a carcinoma occupying the left apex of the lung with extension to the left supraclavicular region and with metastases to the second and third thoracic vertebrae and the mediastinal and peribronchial lymph nodes.

Case 7.—*History.*—A white man aged 39, a machinist, admitted to the hospital Feb. 8, 1938, first noticed a severe aching type of pain, which began in the right shoulder region about Aug. 1, 1937. Shortly after the pain began in the shoulder region it radiated down the inner side of the right arm into the fourth and fifth fingers of the right hand. He was seen by two private physicians and was given a diagnosis by one of neuritis and by the other of arthritis. In September 1937 he first noticed swelling in the right supraclavicular region, and a small mass could be palpated at that time. Approximately three or four months before admission he noticed that there was ptosis of the right upper eyelid and that the right pupil was smaller than the left. Also there was absence of sweating on the right side of the face. There was no history of cough. Loss of weight had been 24 pounds (11 Kg.) since August 1937. There was a marked loss of strength of the muscles of the right upper extremity.

Examination.—There was a Horner syndrome on the right. A firm tumor mass was palpated in the right supraclavicular region. Examination of the lungs revealed dulness to percussion of the right apex.

There was marked weakness of the muscles of the right upper extremity.

Urinalysis was essentially negative. The Wassermann and Kahn reactions were negative. The hemoglobin content was 85 per cent. Red blood cells numbered 4,810,000, white blood cells 11,800.

On roentgen examination a homogeneous density with a well defined border involved the right apical and infraclavicular regions. There was an abnormal angulation of the second right rib posteriorly. There was also evidence of healed tuberculosis in the right lung.

The clinical diagnosis was carcinoma of the right apex of the lung of the superior pulmonary sulcus type.

Summary of Fifteen Cases of Apical Carcinoma of the Lung

Case	Age	Sex	Diagnosis Prior to Admission	Chief Complaint	Wasting or Weakness of Muscles of Hand	Rib or Bone Changes	Horner's Syndrome	Lung Involved	Treatment	Result	Biopsy	Autopsy	Duration of Symptoms, Deceased Patients
1*	37	♂	Tuberculosis	Pain	Yes	Yes	Yes	Right	Surgery	Died	Squamous cell	Yes	6 months
2*	45	♂	Tuberculosis	Pain	Yes	Yes	Yes	Right	Irradiation	Died	No	Adenocarcinoma	18 months
3*	48	♂	Tumor	Pain	Yes	Yes	Yes	Right	Irradiation	Died	Squamous cell	No	15 months
4*	54	♂	Tumor	Pain	Yes	Yes	No	Right	Irradiation	Died	Squamous cell	No	32 months
5*	42	♂	Tuberculosis	Pain	Yes	Yes	Yes	Right	Irradiation	Died	No	No	15 months
6*	48	♂	Psychoneurosis	Pain	Yes	Yes	Yes	Left	Irradiation and chordotomy	Died	No	No	18 months
7*	49	♂	Neuritis	Pain	Yes	Yes	Yes	Right	Irradiation	Died	Squamous cell	Yes	19 months
8*	41	♂	Neuritis	Pain	Yes	Yes	Yes	Left	Irradiation	Died	Adenocarcinoma	No	11 months
9†	45	♂	Tumor	Pain	Yes	Yes	Yes	Right	Surgery and irradiation	Died	Squamous cell	No	6 months
10†	39	♂	Tumor	Pain	Yes	Yes	Yes	Right	Irradiation	In hospital	Adenocarcinoma	...	.....
11†	49	♂	Osteogenic sarcoma	Pain	Yes	No	No	Right	Irradiation	Under observation	Osteogenic sarcoma	...	.....
12†	37	♂	None	Pain	Yes	Yes	Yes	Left	Symptomatic	Died	No	No	4 months
13†	39	♂	Tuberculosis	Pain	Yes	No	Yes	Left	Symptomatic	Died	No	Undifferentiated carcinoma	4 months
14†	39	♂	Neuritis	Pain	Yes	No	Yes	Left	Symptomatic	Died	Adenocarcinoma	Yes	10 months
15†	39	♂	Neuritis	Pain	Yes	Yes	Yes	Right	Irradiation	In hospital	Squamous cell	....	.....

* The first eight cases previously reported[3] with additional observations to date.
† These cases are reported in the text.

Clinical Course.—A specimen was taken for biopsy from the tumor mass in the right supraclavicular region and a histologic diagnosis of carcinoma, squamous cell type, was made. The patient is receiving radiation therapy at the present time. There has been no relief from the pain.

COMMENT

An analysis of the eight cases previously reported [3] with observations to date is as follows: All were white men with an average age of 43.8 years at the time of admission. The right lung was involved in six cases and the left in two. The diagnoses made prior to admission to the hospital were tuberculosis in three, tumor in two, psychoneurosis (hysteria type) in one and neuritis in two. The first symptom in every case was pain in the shoulder and arm on the affected side. Horner's syndrome was present in seven cases and costal or vertebral changes were noted in every case. Six patients were treated with radiation with no appreciable effect; one patient received both irradiation and chordotomy with very little improvement in symptoms. An attempt was made to remove the tumor mass in one case. However, because of the involvement of the mediastinum and brachial plexus, this could not be accomplished. Specimens were obtained for biopsy in five of the cases, four of which were squamous cell carcinoma and one was adenocarcinoma. All eight patients are now deceased, one patient having lived for thirty-two months. The shortest duration of life after onset was six months. The average duration of life from the onset of symptoms to death was 16.7 months. Postmortem examinations were made in three of the eight cases.

Fig. 3.—Appearance of chest in case 4 showing an apical lung tumor in the left apex and scattered metastatic lesions throughout the left lung.

Of the seven additional cases reported in this paper, all the patients were men; six were white and one was a Negro. A primary carcinoma of the terminal bronchiole was the site of origin in six cases. The right lung was involved in four cases and the left lung in three. Pain in the shoulder girdle followed by pain radiating down the arm of the affected side was the first symptom in all cases. Horner's syndrome was present in six cases. Although Pancoast stated that the presence of Horner's syndrome was essential for the diagnosis of a superior pulmonary sulcus tumor, the time of its appearance is quite variable and depends on how early the inferior cervical sympathetics are involved. For that reason the diagnosis can be made without the presence of this syndrome if the other factors are present. Similarly costal or vertebral involvement is not essential for the diagnosis, since it may occur toward the end of the disease rather than when the patient is first seen. Costal changes were present in four of the seven cases. Histologic specimens were obtained in six cases and postmortem examinations made in three of the four cases in which death occurred. A primary osteogenic sarcoma of the left femur with metastases to the right pulmonary apex was the etiologic factor in one case. As previously stated, it is believed that if this metastatic lesion should remain under observation and continue to increase in size, as has been noted from repeated roentgen examinations, it will probably produce Horner's syndrome and costal changes solely because of its location in the thoracic inlet rather than because of any specific properties of the tumor. Three of the patients received irradiation alone with practically no relief from pain or diminution in the size of the tumor. Surgical exploration was done in one case; however, it was found to be impossible to remove the tumor mass. Postoperative irradiation was given with no relief of pain. The average length of life after onset of symptoms in the four patients who died was six months.

SYMPTOMS

The first and most significant symptom complained of in these cases is pain and weakness affecting the parts receiving their nerve supply from the lower cervical and first thoracic nerves. The severe pain in the shoulder girdle which occurs early in the disease is a result of involvement of the origin of the posterior divisions of the first and possibly of the second thoracic common nerve trunks. The pain radiating down the inner aspect of the arm and forearm into the ring and little fingers and wasting of the interosseus muscles and those of the hypothenar and thenar regions corresponds to the ulnar nerve supply from the eighth cervical and first thoracic nerves. Horner's syndrome is a result of involvement of the inferior cervical sympathetic ganglion.

Fig. 4.—Appearance of chest in case 2 showing apical lung tumor in the right apex metastatic from an osteogenic sarcoma of the left femur.

The time of appearance of Horner's syndrome and of the roentgenologic evidence of costal or vertebral changes will depend largely on the rate of growth and the mode of extension of the tumor in the thoracic inlet. The occurrence of severe pain in the shoulder girdle with radiation down the arm with or without Horner's syndrome should prompt one to make a thorough examination of the thoracic inlet both clinically and roentgenologically.

ROENTGEN EXAMINATION

The typical roentgenographic appearance observed in these cases is a small circumscribed homogeneous density in the apex of the lung as a result of displacement of the lung.

Destruction of the posterior portions of one or more ribs and also possibly of the posterior parts of the transverse processes or sides of the bodies of the verte-

brae is generally present. These are entirely different from the roentgenographic appearances of carcinoma of the lung occurring near the hilus.[4]

HISTOLOGIC DIAGNOSES

The histologic diagnoses made from the specimens removed in twelve of the fifteen cases mentioned were six squamous cell carcinomas, four adenocarcinomas, one osteogenic sarcoma (metastatic) and one undifferentiated carcinoma with areas simulating an adenocarcinoma.

ORIGIN OF THE TUMOR

In fourteen of the fifteen cases the site of origin was definitely considered to be the terminal bronchioles of the lung. This was histologically confirmed in twelve of the thirteen cases in which biopsy material was available. Metastatic lesions from carcinoma of the breast, kidney or adrenal and from the stomach to the pulmonary apex have been reported as causing the Pancoast type of tumor; also sarcoma of the thymus, sarcomas originating near the pulmonary apex, intrathoracic sympathoblastoma, and others.[5] By far the

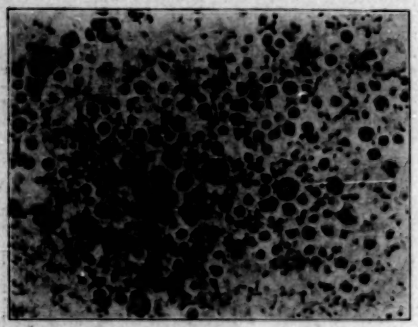

Fig. 5.—Section from tumor in case 71 showing a grade 4 carcinoma, squamous cell type.

majority of cases reported have been atypical carcinomas of the lung.[6] I am of the opinion that these tumors are more common than is generally realized. Since 1936 thirteen so-called superior pulmonary sulcus tumors have been diagnosed at the Hines hospital, all of which have been carcinomas of the lung. More than forty-four cases have been reported in the literature by various authors during the past six years.

TREATMENT

1. *Surgery.*—Because of the location and the mode of extension of these tumors, it is impossible to remove them surgically. Although the tumor may be quite small when seen on the roentgenographic film, extension into the brachial plexus and into the mediastinum will generally be found. Two of the cases in this series were excellent surgical risks from the standpoint of the patient's general condition and the size of the tumor; however, extensions occurred into the brachial plexus and mediastinum at the time of exploration. There have been reports in the literature of good results following chordotomy for the relief of pain. This was done in only one of my cases and the result was not encouraging.

2. *Irradiation.*—This method of therapy has proved to be very disappointing in this type of case. The tumors are quite radioresistant and are not complicated by secondary infections and abscesses, as compared with carcinoma of the lung in general, where definite palliative results may be obtained following irradiation, which tends to clear up the secondary infection about the tumor.

PROGNOSIS

The average duration of life of the twelve deceased patients in this series from the onset of symptoms to death was 13.1 months, one patient living thirty-two months after the onset. The shortest duration of life was four months. Because of the very unsatisfactory methods of treatment for this type of tumor, the prognosis is very poor. It is difficult to explain the rapidly fatal termination in cases of this type on the basis of the physical phenomena alone.

CONCLUSIONS

1. Further evidence shows that the majority of malignant tumors located in the region of the thoracic inlet are carcinomas of the terminal bronchioles of the lung.

2. The prognosis is very poor. The average duration of life from the onset of symptoms in this series of twelve deceased patients was 13.1 months.

3. Because of the location of these tumors in the thoracic inlet and their mode of extension to the brachial plexus and inferior cervical ganglion, surgery is not indicated.

4. Not one patient in this series received any appreciable relief from pain following radiation therapy.

5. Since severe pain about the shoulder radiating down the arm on the affected side is practically the first symptom in all cases, patients thus afflicted should be carefully examined for the other manifestations associated with these tumors in order to rule out a so-called superior pulmonary sulcus tumor.

6. Because of the symptoms, patients having apical lung tumors are generally given a diagnosis of tuberculosis, neuritis or arthritis before a tumor is suspected.

ABSTRACT OF DISCUSSION

Dr. L. H. Garland, San Francisco: There appear to be two general types of primary pulmonary tumors of the upper lobe: those arising in the extreme apex and those arising elsewhere in the upper lobe. A significant percentage of those arising in the extreme apex spread to the adjoining rib or vertebra and produce erosion of bone; they press on or infiltrate the brachial plexus and inferior cervical sympathetic ganglion. When a bronchogenic carcinoma of the lung has extended to these structures, the resultant symptoms of pain in the shoulder and forearm, ptosis of the eyelid and enophthalmos permit one to make a diagnosis of "superior pulmonary sulcus tumor." Dr. Stein has pointed out that only a small number of apical bronchiogenic carcinomas are associated with all these symptoms and that it is unwise to refrain from making a diagnosis of neoplasm in their absence. It has been my privilege to see a large number of primary carcinomas of the lung in the Stanford University Medical Service at the San Francisco Hospital. Many of these have been located in the upper lobe and a few in the extreme apex; only a few of the latter have been asso-

4. Stein, J. J., and Joslin, Hope L.: Carcinoma of the Bronchus, Surg., Gynec. & Obst. 66:903-911 (May) 1938.

5. Evans, W. A., in discussion on Pancoast.[3] Tobias, J. W.: Síndrome apico-costo-vertebral dolorosa por tumor sperimo: Su valor diagnóstico en el cáncer primitivo pulmonar, Rev. méd. latino-am. 17: 1523-1536 (Aug.) 1932; 18:1-304 (Dec.) 1932. Frost, T. T., and Wolpaw, S. E.: Intrathoracic Sympathoblastoma Producing the Symptomatology of a Superior Pulmonary Sulcus Tumor (Pancoast), Am. J. Cancer 30:1 483-492 (March) 1937. Brewster, Jefferson, and DeVeer, J. A.: Varied Pathological Basis for Symptomatology Produced by Tumors in Region of Pulmonary Apex and Upper Mediastinum, Am. J. Cancer 34:307-321 (July) 1938.

ciated with the classic symptoms originally described by Pancoast. Because of the manifestations in these cases and the absence of a significant number of nonbronchogenic neoplasms producing such symptoms, I am inclined to agree with Browder, De Veer and the author that it is unwise to classify tumors on a basis of location and that if adequately studied most of the "superior sulcus tumors" will be shown to be either bronchogenic carcinomas or tumors of the lower cervical lymph nodes. I have observed one case of Hodgkin's disease of the supraclavicular lymph nodes in which all the signs of a so-called superior sulcus tumor were present. In a previous paper Dr. Stein pointed out that the differential diagnosis in cases in which there are symptoms produced by invasion of or pressure on the brachial plexus, erosion of ribs or vertebrae and changes in the sympathetic nerves includes cervical rib, aneurysm, apical tuberculosis, primary or metastatic tumors of the cervical lymph nodes and primary or metastatic tumor of the pulmonary apex. However, Dr. Stein believes, and probably correctly, that in the majority of cases it is bronchogenic carcinoma that produces such symptoms. The two interesting points brought out by Dr. Stein in his present analysis of fifteen cases are the relatively low average age of the patients, 43 years, and the constancy of the presenting symptoms of pain in the shoulder and arm on the affected side.

DR. JUSTIN J. STEIN, Hines, Ill.: Regarding the question of the use of higher doses in cases of this type, I have given as high as 6,000 roentgens without producing any appreciable palliative effect. Many of the patients ask that radiation therapy be discontinued because no improvement can be noted and because a reaction about the brachial plexus causes more pain. In the radiation therapy of carcinoma of the lung, in general I give relatively small total doses, because I believe that all the radiation therapy accomplishes is lessening of the secondary infection and abscess formation about the tumor and possibly some diminution in the size of the tumor. As the secondary infection is lessened the patient's clinical condition is improved. I have not noted the presence of infection about tumors in the apical region, and this may account for the fact that practically no improvement follows the administration of radiation therapy in cases of this type. This group of fifteen cases of tumor of the apex was selected from 200 cases of primary carcinoma of the lung that were observed at the Veterans Administration Facility since 1931.

DR. JOHN MURPHY, Toledo, Ohio: May I ask Dr. Stein to enlarge a little on the method with which he gave this large dose?

DR. STEIN: I use a 10 by 10 cm. portal, from 80 to 100 target skin distance, 2 mm. of aluminum, 1 mm. of copper, from 15 to 20 milliamperes and 200,000 volts.

DR. MURPHY: But the daily dose?

DR. STEIN, Hines, Ill.: The daily dose is 200 roentgens given through two or three portals, alternating the portals.

Sterilization of the Feebleminded.—Sterilization of the feebleminded had been urged as a preventive measure in America even before the present century was ushered in. As early as 1897 Dr. M. W. Barr, in his presidential address before the American Association for the Study of Feeblemindedness, strongly advocated it as the most practical step in a preventive program. In the same year the first human sterilization bill in this country was introduced in the Michigan legislature but failed of passage. Indiana was the first state to enact a human sterilization law. This pioneer statute, passed in 1907, provided for the compulsory sterilization of "confirmed criminals, idiots, imbeciles and rapists." The operation was to be performed after a committee of experts and institutional officials had decided that procreation was inadvisable and that there was no probability of the subject's mental improvement. Later laws in Indiana modified the administrative details of the original statute and extended the scope of sterilization to noninstitutional mental defectives upon the recommendation and approval of the proper authorities.—Deutsch, Albert: The Mentally Ill in America, New York, Doubleday, Doran & Co., Inc., 1937.

THE TREATMENT OF CANCER OF THE EYELIDS

GEORGE S. SHARP, M.D.
Attending Surgeon, Tumor Clinic of the Huntington Memorial Hospital, Pasadena, Calif.; Consultant, Tumor Clinic of the U. S. Administration Facility, Los Angeles
PASADENA, CALIF.

Preservation of tissue and function is seldom considered with greater care in the treatment of cancer than for growths on the eyelids. By the present methods of radiation therapy cancer in this location may be destroyed with minimum loss of normal tissue and consequently without deformity other than that caused previously by the growth itself.

From 1932 to 1937 inclusive, sixty-two consecutive patients with cancer of the eyelids were treated. Positive results from biopsy were obtained for forty-eight patients, and only this group will be considered in this discussion.

ETIOLOGY

Chronic irritation is an important inciting factor for the majority of cancers of the eyelids. A local causative factor, namely eyeglasses, was demonstrated definitely with fourteen patients. The nose piece, either ill fitting or worn and rough, was a factor with eight patients, since the growth started in the depression or on the margin made by the guard. Pressure of the glasses also may contribute to the development and progress of other growths in this vicinity by diminishing the blood supply. With six patients the frame of the glasses or the edge of the glass itself rested on the skin of the lower eyelid and neoplasm developed in the irritated area.

Burn scars of variable duration were causative factors in three cases. One burn was from gasoline and occurred fifteen years previously; the scar became irritated by glasses and ulcerated. Another burn occurred twenty years previously as a result of an ether explosion; the scar broke down for no apparent reason. The third burn was from hot grease and occurred two years previously, and the wound did not heal.

One patient gave an unusual history of having at least fifty styes on each eyelid. The scars from continued infection may easily have altered the skin and blood supply and thus acted as an inciting factor.

Other contributory factors of a constitutional or more general nature must exist, since eighteen patients, or one third in the series, had one or more cancers on the skin of the face in addition to the growth on the eyelid. I found that many of this group were in direct contact with oil and its derivatives. That the face and eyelids had been rubbed with hands soiled with various coal tar products was frequently brought out in the histories. One patient cleaned wood and coal stoves with crude oil and gasoline for forty years. Fifteen years after this exposure he had eighteen cancers on the skin of his face alone and one on an eyelid. The second most frequently encountered factor was sunlight and the elements. Many patients were occupied during their active lives with work requiring them to be exposed to sunlight and all weather conditions. The histories of the eighteen women in this series were not contributory.

Read before the Section on Ophthalmology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

The incidence is greater for men. This series includes thirty men and eighteen women. The majority of patients were elderly, and thirty-four, or 70 per cent, were 60 years of age or older. The oldest patient was a woman of 91, who had a squamous carcinoma near the inner canthus of the lower eyelid. The youngest patient was a man of 24, with a squamous carcinoma involving the lower eyelid a few millimeters from the tarsus.

PATHOLOGY

A determination of the site of origin was difficult with the majority because of the extent of the growth at the initial examination. In all probability the mucocutaneous juncture was the common site (as on the lip), where the factors of irritation are most evident. The skin of the eyelid was demonstrated as the original site in nine cases, and the histories in this group were not contributory. In eight cases the growth originated in one canthus of the eyelids. The inner canthus and the lower eyelid were most commonly affected; the disease is less frequently seen at the outer canthus and on the upper eyelid, although in four cases in this series the cancer was observed on the upper lid. Four growths originated in or near the opening of the lacrimal duct.

Two patients had more than one growth on the eyelids. Two squamous cancers occurred on the upper eyelid of one patient. A basal cell cancer involved the outer canthus of the right eyelids and the inner canthus of the left eyelids. Multiple cancers on the skin of the face in addition to the growth on the eyelid were observed in eighteen cases, or approximately one third of the series.

The pathologic structure of neoplasms on the eyelids was fairly uniform. The basal cell type occurred in thirty-eight cases and the squamous type in eight cases, and in one case the growth had both basal and squamous characteristics. A metastasis to the eyelid occurred in one case from a cancer of the pancreas. Three cancers started in the adjacent skin and involved the eyelid secondarily.

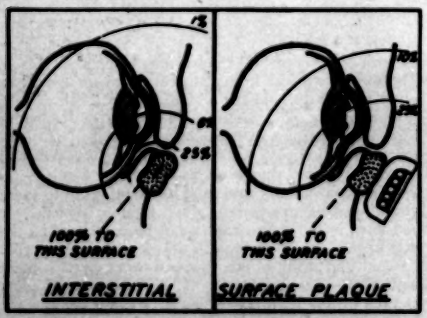

Fig. 1.—Relative distribution of radiation intensities in radium treatment of cancer of the eyelid. Diagrams showing doses delivered to the growth by interstitial and external irradiation. Note the relative doses delivered to the surrounding tissues by the two methods of application, as indicated by the iso intensity lines.

The basal cell type progresses by direct extension and burrows into the deeper layers of the skin and the subcutaneous tissue. The ulcer itself usually does not enlarge in proportion to the growth of the tumor, and a false impression of the actual size may result unless the elastic, smooth, translucent thickening around the ulcer is clearly apprehended. The periphery of the tumor may be entirely free of the overlying skin, and this type is always radiation sensitive; such swellings disappear very rapidly when they are treated by either external or interstitial radiation.

Fig. 2 (case 1).—An extensive, superficial basal cell growth of the eyelids treated by external irradiation.

The squamous cancer is more aggressive and destructive. It may begin as a hypertrophic, warty growth which undergoes necrosis in the center early, or as a nodule or fissure. Invariably ulceration appears early in the form of a flat, superficial ulcer with hard, everted edges. It is more apt to invade and destroy the tissues, and, potentially, the squamous growth is capable of producing metastases to regional lymph nodes, although no metastasis was demonstrated in this series. The preauricular or upper deep cervical lymph glands are the first affected when metastasis does occur.

SYMPTOMATOLOGY AND DIAGNOSIS

Early signs and symptoms were not uniform, and recognition was difficult. A hypertrophic wart, crust, flat superficial ulcer or fissure or a fine, granular ulcerated nodule was the first sign observed by twenty-four patients. In all probability the majority of these patients passed through a precancerous keratotic stage. A hypertrophic, warty growth with intermittent crusting is regarded as a precancerous lesion and should be considered suggestive of early malignant changes. A lump or nodule was first observed by twelve patients, and their meaning for this term included thickening in the skin, styes and cysts. Three patients observed a cyst first, and one patient stated that it was present for twelve years without change before activity was observed. Five patients observed a pimple that progressed in spite of the customary attentions. Four patients described a small pigmented mole that became active.

The typical appearance of a growth on the eyelids is similar to one on the skin elsewhere. The majority, and especially the basal cell type, begin as a semitransparent nodule with a depressed center, which subsequently breaks down to form an ulcer. A crateriform appearance is common. The raised, rolled margin is pearly, and an impression of the depth of invasion may be gained by the edge, which is usually undermined and indurated. The ulcer progresses and if untreated spreads both laterally and in depth, destroying all tissues

in its path. Other growths arise in cysts or in the base of hair follicles and may not be ulcerated, but their dome-shaped appearance with a pearly glaze may be of diagnostic value. The induration is the same, and if the surrounding tissues are involved the rolled edge is evident. Occasionally the basal cell growths appear brownish because of pigment, but this color is usually lost when they become ulcerated.

The duration of the history of the signs or symptoms parallels roughly the size, rather than the type, of the growth. The age of the patient likewise was not consistent with the duration of the lesion, although the youngest patient, a man aged 24, had a squamous growth of only two months' duration. Other patients had an equally short history; for example, a man aged 84 had a basal cell cancer of the same size, also of only two months' duration. The longest history was fourteen years, and the average duration before treatment was twenty months.

Symptoms are negligible except when the growth has invaded the conjunctiva; then foreign body symptoms result, and inflammation, excessive lacrimation and photophobia usually follow. Involvement around the orifice of the lacrimal duct may obstruct it and cause lacrimation. Pain was not mentioned by any one in this series even though many growths were large and several were attached to the periosteum. Involvement of the canthus may cause inflammation of the lids and pain on movement.

After a complete description and examination of the growth, a positive diagnosis can be made only by a microscopic study of biopsy material taken from the growth. Differentiation between a benign and a malignant process is the first consideration. Whether the malignant growth is squamous or basal cell cancer must be established entirely by the microscopic study.

TREATMENT

Irradiation procedures are employed successfully in the treatment of cancer of the eyelids. The effective, or cancerocidal, dose is calculated according to the

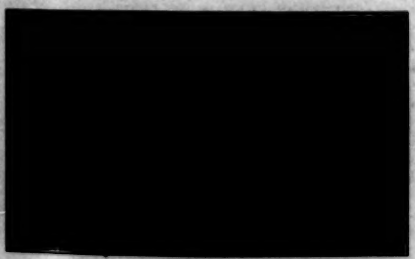

Fig. 3 (case 2).—A superficial basal cell growth treated interstitially.

dimensions and histologic type of the growth. The radiation is delivered either by a surface application of radium or interstitially by means of radium needles or radon seeds; in the majority of cases a combination of surface and interstitial irradiation will give the best cosmetic result. Decision for the selection of these procedures depends on the location, proximity to bone, involvement of the lacrimal duct or sac, degree of invasion and adaptability of the procedure for the individual case. By carefully controlled irradiation complete regression of the growth may be expected with a minimum deformity and without late radiation damage to surrounding structures.

The physical factors involved in planning radium treatments include filtration, distance from source to skin, protection of surrounding tissues and in the case of radon the rate of decay of the source.

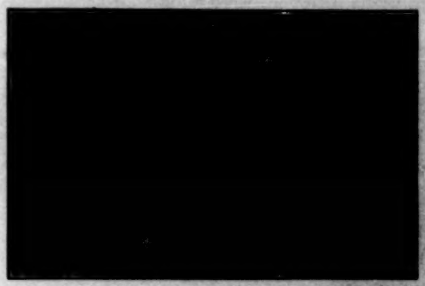

Fig. 4 (case 3).—Invasive basal cell growth which was treated by surface and interstitial radium therapy.

The filtration in every case is sufficient to remove all the beta rays, which are very active destructive agents and if not removed by sufficient filtration often result in damaging necrosis.

The greater the distance from the source (or applicator) to the skin, the greater will be the percentage of the skin dose which will be measured at a given depth below the skin. By increasing the source-to-skin distance, the actual absolute intensity is decreased, but the relative depth effect is increased. In the series here presented the applicator was placed directly on the skin.

The lead protection for the eyeball and crystalline lens may be placed at the eye, under the lid or at the plaque itself. In the interests of the patient's comfort this protection usually took the form of a 2 mm. lead screen applied to the portion of the applicator from which would emanate the rays which would reach the tissues to be protected. The protective screen is shown in figure 1 as it reduces the intensity according to isodose lines in the chart.

Application of the inverse square law of decrease of intensity from the source serves as the best protective measure for interstitial needles or radon seeds. Since the intensity decreases with distance from the source, their greatest activity is immediately surrounding them. For this reason they are injected directly into the growth. Normal surrounding tissues are automatically protected by the decrease in intensity with distance.

The anatomic architecture and geometric considerations in the individual case to a large extent determine the choice of the physical variables, such as filtration, distance and protection.

From 1932 to 1937 inclusive, forty-eight patients for whom biopsy showed cancer were treated. Treatments according to years were as follows: 1932, three patients; 1933, four; 1934, eight; 1935, eight; 1936, nine, and 1937, sixteen. The procedures were varied widely in order to meet the requirements for each particular growth.

Fourteen patients in the series had recurrences after previous treatment. Six had been treated only once

before, two by an electric needle and four by low voltage roentgen therapy. The remaining eight patients had been treated more than once by various means, such as the electric needle, cautery, surgical intervention and freezing. The scarring which followed such procedures caused considerable deformity in many instances, and the irradiation problem was more difficult than for the uncomplicated and untreated growths.

Postoperative Irradiation.—Excision was performed for diagnosis as well as treatment on three growths which were small, nonulcerated and clinically without positive diagnosis. Two of the three were near the tarsus, and postoperative interstitial irradiation was done when the wounds healed. The scars were less than 1 cm. in length, and two 2 mg. radium needles having a filtration value of 1 mm. of platinum were placed under them for a total dose of approximately 300 milligram hours.

Surface Irradiation.—The application of radium on the surface of a growth demonstrates its radiation sensitivity and the selective effect toward radium most clearly. Topical radiation was the only treatment given

Fig. 5 (case 4).—An aggressive basal cell cancer which involved both eyelids and the periosteum at the margin of the orbit. Destruction of the growth was accomplished by combined surface and interstitial radium therapy without deformity.

eighteen patients. The growths receiving this type of treatment were superficial and at a distance from the tarsus. Lesions near the lacrimal duct were also included in this group, in order to avoid unnecessary fibrosis and distortion. A small square plaque (2.5 cm. by 1 cm.) containing 25 mg. of radium and 2 mm. of brass filtration was the common applicator for growths 1 cm. in diameter or less. A protection of 2 mm. of lead was fastened along the surface of the plaque nearest the lens. The application was made directly on the surface of the growth, and a dose of from 450 to 650 milligram hours was delivered in one treatment. The reaction appeared ten days later and persisted for three or four weeks. Healing should be retarded by applying ointments, yellow mercuric oxide (1 per cent), boric acid ointment or white petrolatum. Gauze patches with the ointment retard healing even further, until the primary site is smooth and the skin is permitted to grow over the area slowly, without contraction.

Interstitial Irradiation.—Treatment by radium needles or radon seeds was the only treatment given sixteen patients. All those with squamous cancer were included in this group and certain of those who had cancer of an aggressive basal cell type which demonstrated growth at a depth but with a diameter of less than 1.5 cm.

As before mentioned, several of the patients had been treated previously by various destructive agents, and recurrences were found in the scars. The growth, either basal cell or squamous, is more resistant in scar tissue, and the radiation is more effective when applied interstitially. Removable radium needles are preferable to radon seeds because there is less scarring and because no foreign bodies are left in the tissues. Not infrequently the radon seeds prolong the reaction unnecessarily by their presence, and many times they must be removed some months later. Radium needles containing 2 mg. of radium with a filter of 1 mm. of platinum were used for this group. The needles were placed directly under the growth in most instances, horizontally, a few millimeters apart. As many needles were implanted as was practicable for the most efficient irradiation, so that the duration of exposure was a minimum. The dose was calculated according to the type and dimensions of the growth, the special requirements of recurrent growths in scar tissue being taken into consideration. The average treatments were from 350 to 700 milligram hours.

Swelling of the lids occurred with the insertion of the needles, and this usually persisted to a varying degree throughout the reaction period of from four to six weeks. The reaction was similar in all respects to the effects after external irradiation.

Combined Surface and Interstitial Irradiation.—A preliminary surface application of radium followed by interstitial therapy is necessary for most growths over 1.5 cm. in diameter and also for those which invade either the surrounding structures to a considerable depth or the orbital tissues. The application of both external and interstitial sources of radium enables the therapist to avoid unnecessary changes in the skin or subcutaneous tissues. The total dose and the fraction assigned to each method of treatment is dependent on both the diameter of the growth for the surface therapy and the depth of invasion for the interstitial treatment. Approximately one third of the total dose was delivered by an external source and two thirds by interstitial application of radium needles or radon seeds. Eleven patients were treated by the combined methods. Although their growths were the most extensive in the series, the reactions were not greater in severity and duration than those that followed the single procedures for the smaller growths.

The various procedures in this series of cases were primarily successful, with the complete disappearance of the growth in all instances. All the patients have been followed to the present time except one who was treated in 1935 and was followed for eight months. Seven patients died of intercurrent disease without evidence of recurrence or metastasis. The remaining patients (forty) are free from disease, but for only eighteen of these has three years yet elapsed after the last treatment.

The prognosis for cancer of the eyelids is excellent when irradiation is used, and one may expect complete regression of the cancer, with a minimum deformity and rare late radiation effects in the lens, cornea, conjunctiva or skin.

REPORT OF CASES

CASE 1.—W. C. C., a man aged 65, a carpenter, examined Aug. 9, 1937, complained of a growth on the eyelid and one on the ear. Ten years previously a small lump appeared below the inner canthus of the eye. It was itchy and frequent irritation

caused it to open, and growth was gradual to the present size. From the site of onset the growth involved the lids by direct extension. Symptoms of conjunctivitis and excessive lacrimation had been annoying during the past few weeks.

On examination a nodular, ulcerated growth 3.5 cm. in its longest diameter was seen involving the inner canthus of the right eye and the medial fourth of both eyelids. It infiltrated the full thickness of the eyelids, and the conjunctiva on the under surface of the lids was involved. The growth surrounded the

Fig. 6 (case 5).—Involvement of three-fourths of the lower eyelid with invasion of the conjunctiva and orbital tissues. Combined surface and interstitial therapy was necessary to destroy the growth by radiation with minimum deformity.

tear duct and extended down to the lacrimal sac, with possible early invasion of the sac. The skin on the side of the nose as well as down over the cheek was extensively involved. The left auricle was partially destroyed by the same type of growth. The specimen taken for biopsy showed the presence of basal cell carcinoma.

On August 10 a rectangular plaque (2.5 cm. by 1 cm.) containing 50 mg. of radium with 2 mm. of brass filtration was applied over three areas directly on the surface of the growth. A protection of 2 mm. of lead was fitted to the ocular side of the plaque. The applications consisted of one over the inner canthus, one on the nasal portion and another on the facial portion. The inner canthus received 800 milligram hours, and the other areas were given 600 milligram hours each.

The reaction was acute, and the patient's discomfort was alleviated with yellow mercuric oxide (1 per cent) or white petrolatum for the conjunctival reaction and with boric acid ointment for the skin. The area was entirely healed in two months, and now there are no symptoms and no deformity or impaired movement of the eyelids.

CASE 2.—W. J., a man aged 76, a farmer from Texas, first seen Nov. 16, 1934, complained of a sore on the lower eyelid. The skin of the face had always been sensitive, and previously several growths had been treated by desiccation and low voltage roentgen therapy. Eight months previously a growth appeared on the eyelid similar in onset to those elsewhere on the face. Enlargement was gradual to the present size.

On examination an ulcerated growth 1.5 cm. in diameter was seen involving the midportion of the left lower eyelid. The edges were rolled, and it widened the lid by direct invasion. Early involvement of the conjunctiva had already taken place. The tarsus was involved and partially destroyed. The biopsy specimen showed a basal cell carcinoma.

Two 2 mg. radium needles with 1 mm. of steel filtration were inserted November 22 beneath the growth, one at each end. A dose of 160 milligram hours was given.

A very acute local reaction followed, with conjunctivitis, lacrimation and photophobia. The area healed in six weeks, and there is no discomfort, deformity or impaired vision now, nearly four years after treatment.

CASE 3.—H. B., a housewife aged 75, first treated March 26, 1936, had first observed a small pimple in 1933. It had enlarged gradually until six months previously, when she scratched and opened it. Growth had since been rapid.

On examination an ulcerated growth 2 cm. in diameter was seen involving the outer half of the right lower eyelid. The crater of the growth was several millimeters below the surface of the skin, and the full thickness of the lid was invaded. The margin of the lid was distorted because of involvement of the tarsus. The biopsy specimen showed a basal cell carcinoma.

On March 26 a radium plaque (1.5 cm. by 1 cm.) containing 25 mg. of radium with a 2 mm. brass filter was applied on the surface. A protection of 2 mm. of lead was fitted on the upper surface of the plaque, and a dose of 400 milligram hours was given. On March 30 four 0.3 mm. gold seeds containing 1.2 millicuries of radon each, or a total of 4.8 millicuries, were inserted.

The patient had little discomfort, and at present, over two years later, there is no deformity of the lid and no complaint of dryness or impaired vision.

CASE 4.—O. W. S., a man aged 62, a broker, examined Aug. 2, 1932, complained of a sore on the eyelids. A small pimple was first noticed at the outer canthus of the right eye six years previously. It grew gradually into a dome-shaped tumor that involved both eyelids. One year previously it ulcerated and doubled in size.

On examination a crater-like growth 2 by 1.5 by 1 cm. in diameter was observed at the outer canthus of the right eye. It involved the upper and lower lid equally and infiltrated through the thickness of the lids, but the conjunctiva was not ulcerated. The growth was attached to the periosteum, and early invasion of the lateral tissues of the orbit was evident. The biopsy specimen showed a basal cell carcinoma.

On August 2 a rectangular radium plaque (2.5 cm. by 1 cm.) containing 50 mg. of radium with 2 mm. of brass filtration was applied vertically on the surface. A protection of 2 mm. of lead was fitted to the ocular side of the plaque, and a dose of 1,000 milligram hours was given. On August 11 two 0.3 mm. gold seeds containing 1.5 millicuries of radon each were inserted, one into each eye.

The reaction was acute; photophobia persisted for six months, and this sensitivity recurred in 1934. At present, over five years after treatment, there is no evidence of disease, photophobia or lacrimation. The lateral part of the conjunctiva is whitened and at times dry. Vision is not impaired in the eye.

CASE 5.—G. N., a woman aged 37, a housewife, first seen May 12, 1935, complained of a tumor of the eyelid. In 1922 a lump first appeared on the eyelid; it was desiccated soon after the

Fig. 7 (case 6).—Destruction of the inner fourth of both eyelids and involvement around the lacrimal duct. Complete destruction of the growth was accomplished by the combined applications of radium without deformity or destruction of the lacrimal duct.

onset. A recurrence appeared, and desiccation was attempted again in 1925 and 1928. An operation was performed in 1930; the wound failed to heal, and there was gradual growth to the present size.

On examination an ulcerated crater-like growth 2.5 cm. in diameter was observed extending down from the free margin of the left lower eyelid. It infiltrated through the full thickness of the lid, and the tarsus appeared invaded or at least surrounded. When the lid was drawn down the growth showed early

invasion of the conjunctiva, and there were two minute ulcerations. The growth moved over the maxilla even though there was invasion along the floor of the orbit. A biopsy specimen showed basal cell carcinoma.

On May 12, 13 and 14 a plaque (1.5 cm. by 1 cm.) with 25 mg. of radium and 2 mm. of brass filtration was applied on the medial and lateral halves of the growth directly on the surface. A protection of 2 mm. of lead was fitted along the upper surface of the plaque, and a dose of 900 milligram hours was given over each area, or a total of 1,800 milligram hours by external irradiation. The reaction appeared on May 22 and soon became acute. On August 16 five 0.3 mm. gold seeds containing 0.8 millicurie of radon, or a total of 4 millicuries, were inserted, two along the floor of the orbit and three along the tarsus.

The radiation reaction was intense, with lacrimation and photophobia. At present, three years later, there are no complaints of lacrimation, dryness, photophobia or impaired vision.

Case 6.—M. M., a woman aged 62, a housewife, first seen on Jan. 4, 1934, complained of a sore on the eyelids. Two years previously she was burned with grease, which broke her glasses and burned her eyelids severely. The burn healed slowly to an area a few millimeters in diameter and then gradually opened to its present size. The patient attributed the lack of healing to the glasses, which rested directly on the sore.

On examination an ulcerated growth 2.5 by 2 by 0.4 cm. in diameter was observed at the inner canthus of the right eye. It infiltrated the inner part of both lids and extended over on the bridge of the nose to the midline. The full thickness of the skin was involved, and the growth moved over the periosteum. There was involvement up to the lacrimal duct, but there was no induration around it. The biopsy specimen showed basal cell carcinoma.

On January 6 a rectangular radium plaque (2.5 cm. by 1 cm.) containing 50 mg. of radium with 2 mm. of brass filtration was applied horizontally on the surface. A protection of 2 mm. of lead was fitted to the ocular end of the plaque, and a dose of 950 milligram hours was given. On February 19, after the acute reaction had subsided, three gold seeds were inserted, each containing 1.3 millicuries of radon. One radon seed was placed above the inner canthus, one below and the third still deeper along the medial wall of the orbit.

The reaction became acute again and persisted until the third week of March. The irritation subsided slowly, and now, over four years subsequent to treatment, there are no symptoms of dryness, excessive lacrimation or visual changes and no deformity.

65 North Madison Avenue.

ABSTRACT OF DISCUSSION

Dr. Everett L. Goar, Houston, Texas: The subject is one not often discussed before ophthalmologists, probably because few ophthalmologists attempt to treat cancers of the eyelids. We are as much in the dark about the cause of these growths as we are of cancer elsewhere. Chronic irritation undoubtedly plays a part and perhaps the reason the lesion appears oftenest at the inner canthus is that it is most bathed by excessive tears or secretion. The guards of eyeglasses may cause irritation on the skin of the nose which could easily involve the eyelid by extension, but as for eyeglasses initiating a growth within the lid itself, I doubt that it is possible. It has been my custom to refer patients in whom I suspected a malignant lesion of the eyelids to a dermatologist for treatment. I do not believe that treating these lesions surgically serves the best interest of the patient. It is true that these growths can be removed safely and surely by wide excision, by cautery or by fulguration, but the loss of tissue and subsequent scarring are undesirable. Many a patient has been subjected to a plastic operation on the eyelid who would not have needed it if the neoplasm had been treated primarily by radium. Dr. C. M. Griswold has furnished me with statistics of patients treated by him during a ten year period. His records show 208 cases of cancer of the eyelids in 136 males and seventy-two females. One hundred were at the inner canthus, twenty-four at the outer canthus, sixty-eight in or near the central area of the lower lid and sixteen in or near the central area of the upper lid. Five of the patients were under 30 years of age but the vast majority were 50 or over. About 5 per cent of the cancers were of the squamous cell type, while 95 per cent were basal cell or basosquamous. All these patients were treated by the topical application of radium, with an average of 550 mg. hours. There were eight failures in the group. Most of the remainder have been followed for a varying period of from one to ten years and are satisfactorily healed. Cicatricial ectropion has not occurred as a complication from the treatment, but in five cases in which the lesion had perforated the lid and the conjunctiva was involved, symblepharon developed. No irradiation cataract has been noted in the series. All patients had a permanent loss of lashes on the affected lid. Dr. Griswold has used the same technic throughout the series. A 2 mm. lead mold which is wrapped in pure gum rubber to prevent secondary irradiation is placed between the radium and the cornea. The radium plaque, encased in a 0.5 mm. platinum shield, is applied directly to the lesion. Three or four applications are made within a week. In the majority of early cases this has caused the lesion to disappear within six or seven weeks, leaving a thin, pliable scar that is scarcely visible.

Dr. Dohrmann K. Pischel, San Francisco: Many ophthalmologists have felt that, when possible, surgical excision of small epitheliomas is the simplest and quickest method for dealing with these tumors. If small, this appears to me to be quite correct. If the surgical procedure is properly planned and executed, no deformity will result and the convalescence is short and comfortable. However, the small lesions that are amenable to surgery are also most amenable to irradiation and I myself feel that irradiation is the method of choice in such radiosensitive tumors as Dr. Sharp has described. Unfortunately, these cancers are most often seen when in a late stage, and here surgical treatment is impossible. It is interesting, therefore, to see the excellent results that can be achieved by radiation therapy. It must be emphasized that such excellent results are not to be obtained by careless work. The whole procedure must be carefully planned and carefully carried out. Haphazard irradiation will produce incomplete results or, what is worse, marked deformities. Even at best, some occasional atrophy of the lids may result, with ectropion, entropion or trichiasis. These situations can usually be successfully remedied by simple plastic procedures. This must be qualified by the statement that those procedures are simple if properly executed.

Dr. Otis A. Sharpe, San Francisco: I report a case that was not treated with radiation. I present it because of the radical prophylactic procedure against metastasis. The patient presented herself at the clinic in February 1932 complaining of a small lump in the middle of the right upper lid. She stated that she had had something on this lid, which she described as a pimple, for some months, but that in the last few weeks it had grown rapidly. The growth was the size of a large garden pea. Both upper and lower lids were removed, the orbit exenterated, and a graft applied to the orbit. The pathologist's report on biopsy was basal cell carcinoma with very little evidence of mitosis. The patient presented herself at the clinic in February 1937 complaining of severe pain in the legs, in the pelvic region and in the lumbar region. X-ray studies revealed large punched out areas which had destroyed the larger portion of the bones of the pelvis and the upper fourths of the femurs, definitely involving the lumbar vertebrae. The right half of the diaphragm was found to be elevated, suggesting a tumor mass anterior to the diaphragm, possibly the liver. There were no definite metastases to the lungs. The skull showed no irregular osteoporosis. The areas of decreased density were not punched out as one would expect with a multiple myeloma. There was some thickening of the cranial vault. The upper end of the sternum appeared to be somewhat cystic in character similar to changes seen in the pelvis. A biopsy specimen was taken from the sternum and examined by another pathologist along with the first pathologist and the microscopic pictures of the two, viz. the original lid tumor and the sternum section, were found to be identical.

FOCAL INFECTION: QUARTER CENTURY SURVEY

FRANK BILLINGS LECTURE

WALTER L. BIERRING, M.D.

DES MOINES, IOWA

It seems particularly fitting that the annual lectureship established by the Section on Practice of Medicine should commemorate the name of Dr. Frank Billings. His eminent leadership influenced in a large measure the development of this and other scientific sections of the Association. Furthermore, in the field of medical education and as a builder of medical schools, hospitals and research institutes he left an enduring impress on American medicine.

Of his many contributions to clinical medicine the most outstanding is the modern concept of focal infection as related to chronic systemic disease, which was first presented in his classic article [1] entitled "Chronic Focal Infections and their Etiological Relations to Arthritis and Nephritis."

In the passing of a quarter of a century the many implications of this concept, some rather controversial, have been widely discussed, so that it appears timely to attempt an evaluation or survey of focal infection at this time.

The primary report of Billings comprised ten cases of chronic arthritis and six cases of subacute and chronic parenchymatous nephritis, the local infective focus in each instance being located in infected faucial tonsils, which when completely enucleated brought about a favorable therapeutic result.

A second article,[2] published in 1913, presented a study of seventy patients with arthritis deformans and confirmed the principles announced in the first article. It was found that the focal disease was usually located in the head and was most frequently a chronic streptococcic infection of the faucial tonsils. In this study arthritis deformans was regarded as an infectious clinical entity, manifesting chronic periarthritis, synovitis, proliferative and degenerative osteo-arthritis, chronic myositis with contraction of muscles and perineuritis or neuritis, as well as the usual coincident but secondary malnutrition and faulty metabolism.

In a paper read before the Section on Practice of Medicine in 1914 Billings [3] discussed the broader application of focal infection in the etiology of general disease, considering it a chief factor in its etiologic relation to acute rheumatism, chronic deforming arthritis, gonorrheal arthritis, malignant endocarditis, myositis, myocarditis, septicemia of various bacterial types, tuberculous nephritis, visceral degeneration, certain infectious types of thyroiditis, acute and chronic pancreatitis, peptic ulcer, duodenal ulcer and cholecystitis.

The Lane medical lectures [4] on the subject of focal infection were delivered in San Francisco in 1915. Billings defined the focus of infection as "a circumscribed area of tissue infected with pathogenic microorganisms" and said that the term focal infection implied (1) that such a focus or lesion of infection existed, (2) that the infection was of bacterial nature and (3) that as such it was capable of dissemination resulting in systemic infection or infection of other contiguous or noncontiguous parts. This focus of infection might be located anywhere in the body and was usually in the head in the form of an alveolar abscess, a deep tonsillar or peritonsillar abscess or chronic sinusitis. Cholecystitis, acute and chronic appendicitis, a submucous or subcutaneous abscess anywhere, salpingitis, vesiculitis seminalis and prostatitis were regarded as further examples of local conditions. Over-repaired teeth could cause or prolong alveolar disease. A tonsillectomy might add a sealing scar to the infected tonsillar stump.

Billings contended that a new principle was not involved, because it had long been known that acute rheumatic infections, including arthritis and endocarditis, were frequently the result of primary infection in the faucial tonsils, that acute parenchymatous nephritis could result from the toxemia incident to diphtheria, that acute gonorrheal arthritis had its source in a focal infection in the urinary or genital tract and that acute severe localized infections in various parts of the body might give rise to disease in remote tissues. However, the importance from the standpoint of chronic, low grade, often symptomless infections in such regions, although emphasized repeatedly by good clinical observers, was not recognized until Billings and his co-workers recorded their clinical observations and correlated experimental studies on animals.

Many of the statements made in the first article regarding the concept of focal infection were destined to constitute definite arguments against subsequent criticism. For example, the experimental fact was recognized that a streptococcus from any source might produce acute articular lesions in inoculated animals, especially rabbits; that bacterial specificity was not established, and that general hygienic treatment was necessary for all classes of patients treated, this general treatment often having a good deal to do with the favorable outcome of the systemic disease.

It was definitely stated that the purpose was not to advocate unnecessary surgical procedure but to show that if focal disease existed it might produce acute disease or chronic degenerative changes in any organ of the body and should be radically eliminated and, finally, to call attention to a source of general disease which, while recognized by a few, was entirely ignored by the many.

Dr. Billings was fortunate in having available a large medical service and trained laboratory co-workers such as Drs. D. J. Davis, Leila Jackson, H. K. Nicoll and E. C. Rosenow. The last named became in a large measure the laboratory exponent of Billings, and his extensive investigation on the streptococcus and focal infection expressed the thoughts of his chief and at all times had his fullest endorsement.

The tissues and exudates of the different foci yielded various pathogenic bacteria, of which streptococci, pneumococci and staphylococci were most commonly found.

Gonococci were detected in infected fallopian tubes, seminal vesicles and related organs, and tubercle bacilli occasionally in tonsillar and peritonsillar tissues.

Organisms of the streptococcus group obtained from foci showed in many instances a pathologic specificity for certain tissues when injected into rabbits or other animals. The brilliant work of Rosenow [5] in demon-

Read before the Section on Practice of Medicine at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938

1. Billings, Frank: Chronic Focal Infections and Their Etiological Relations to Arthritis and Nephritis, Arch. Int. Med. 9:484 (April) 1912.
2. Billings, Frank: Chronic Focal Infection as a Causative Factor in Chronic Arthritis, J. A. M. A. 61:819 (Sept. 13) 1913.
3. Billings, Frank: Focal Infection, J. A. M. A. 63:899 (Sept. 12) 1914.
4. Billings, Frank: The Lane Medical Lectures, New York, D. Appleton & Co., 1915.
5. Rosenow, E. C.: J. Infect. Dis. 14:1, 1914.

strating the transmutability of the micro-organisms of the streptococcus-pneumococcus group permitted at the time a better understanding of the changing pathogenicity of these bacteria. It was generally accepted that transmutation of a strain of this group could occur in the focus of infection, the oxygen supply of the tissues about the focus being an important factor in the transmutation.

These interesting experiments, carried on mainly by Rosenow, attempted to prove that strains obtained from patients with chronic arthritis, rheumatic fever with endocarditis and pericarditis, myositis, peptic ulcer (surgically excised), cholecystitis (surgically treated) and chronic infectious endocarditis (proved by blood culture) when injected resulted in the production of the respective lesions in the experimental animal.

It was on the basis of such experimental results that Rosenow [6] introduced the term elective localization with special application to streptococci and started a controversial discussion, particularly among bacteriologists and immunologists, that continues to this day.

EXPERIMENTAL INVESTIGATIONS

For the next ten or fifteen years the interest in focal infection was largely concerned with experimental investigations pertaining to selective tissue affinity and elective localization either separately or in connection with special clinical observations. To a large extent the subsequent publications were either confirmatory or critical of the concept of focal infection advanced by Billings and the results of bacteriologic investigations reported by Rosenow and his associates.

The unusual results obtained by Rosenow were evidently due to the use of special culture methods devised by him for excised tissues, blood and other fluids, in which due regard was given to the question of oxygen pressure, particularly in primary cultures. Rosenow was able to obtain positive cultures frequently, while cultures made in the usual way remained sterile. For example, Streptococcus viridans was cultured in cases of chronic infectious endocarditis, while the usual cultures suggested the "bacteria-free" stage of Libman incident to this disease.

The relation of selective affinity for certain tissues formed the basis of elective localization of many of the pathogenic bacteria concerned with focal infection. This was conceived to be due to the circumstance that the conditions for growth are more favorable in some tissues than in others.

Following Rosenow's numerous publications on elective localization a mass of experimental work developed, of which only a limited number of instances can be cited at this time.

The work of Rosenow was confirmed in detail by Russell L. Haden,[7] who followed closely certain fundamental technical details insisted on by Rosenow. The contribution of Haden was concerned primarily with the study of kidney lesions developing in rabbits as a result of the intravenous injection of bacteria, usually streptococci, recovered from patients with periapical dental infection. His report included also six cases of pyelonephritis studied to determine whether the condition from which the patient suffered could be reproduced in animals with the bacteria isolated from foci of chronic infection.

The material in every case was cultured in deep tubes of dextrose brain broth and dextrose brain broth agar mediums, in which the organisms found in chronic foci grew luxuriantly and also retained their elective affinity. The organisms recovered from patients with periapical infection were usually nonhemolytic streptococci. The animals were inoculated intravenously with 5 cc. of the twenty-four hour brain broth culture and killed in from three to six days. Four hundred and sixteen rabbits were inoculated and examined post mortem. Of this number 166, or 40 per cent, showed gross lesions of the kidney. The lesions encountered were cortical abscesses, pyelonephritis, acute hemorrhagic nephritis and subacute parenchymatous nephritis. By far the most common type of lesion was pyelonephritis manifested as edema, necrosis and abscess formation in the medulla of the kidney, usually extending well down to the tip of the papilla.

The frequency of kidney lesions occurring after intravenous injection showed clearly the great pathogenicity for kidney tissue of bacteria recovered from chronic foci. Also the type of lesion produced most commonly in animals corresponded to the lesion occurring most frequently in patients; namely, pyelonephritis.

Haden said that the most convincing proof of the relation of a focus to a disease was the reproduction in animals of the disease from which the patient suffered with the organisms recovered from a chronic focus in the patient. Additional proof was afforded by the effect of the removal of the focus on the clinical course of the disease. Six patients were studied in this connection, all having clinical symptoms of pyelonephritis. Twenty-eight rabbits were inoculated with cultures from teeth with periapical infection extracted from the six patients concerned, and in twenty-four, or 89 per cent, gross kidney lesions developed. In contrast to these results, only 40 per cent of all the animals inoculated showed kidney lesions.

The very much higher percentage of such lesions with cultures from patients with kidney disease showed clearly that the organisms in the infected foci had acquired some special affinity for kidney tissue. It was also most suggestive of a causal relation of the dental infection to the kidney disease. The improvement in the patients' condition following the removal of the chronic foci made the connection even more probable.

These results were confirmed by a second study of Haden,[8] on the elective localization of bacteria in peptic ulcer. This study was on twelve patients with peptic ulcer. Streptococci were grown from the root tip of one or more teeth or from areas of infected bone in each case. In some cultures staphylococci were recovered with the streptococci. The streptococci were usually of the nonhemolytic type. All cultures were made in dextrose brain broth and dextrose brain agar, mediums which provide every degree of oxygen tension. Forty-five rabbits were inoculated intravenously with the broth cultures, the strain from each patient being injected into at least two rabbits. Twenty-four, or 53 per cent, of the animals showed at necropsy lesions in the stomach or duodenum or both. There were positive results in at least one animal for each patient.

During the period covered by these experiments, 535 other rabbits were similarly inoculated with cultures from the dental foci of 191 patients not known to be

6. Rosenow, E. C.: Elective Localization of Streptococci, J. A. M. A. 65: 1687 (Nov. 13) 1915.
7. Haden, R. L.: Am. J. M. Sc. 169: 407 (March) 1925.
8. Haden, R. L.: The Elective Localization of Bacteria in Peptic Ulcer, Arch. Int. Med. 35: 457 (April) 1925.

suffering from peptic ulcer. Of these only forty, or 7 per cent, showed at necropsy lesions in the stomach and duodenum.

Another point advanced by Haden in favor of the causal relation of chronic focal infection to peptic ulcer and also of the theory of elective localization was the anatomic location of the gastric and duodenal lesions in the experimental animals. It is well recognized that gastric ulcer may occur in any part of the stomach but is much more frequent in the pyloric region. The experimental gastric lesions had a similar distribution. Clinically duodenal ulcer is always limited to the first third of the duodenum. In every animal but one in which a duodenal lesion was observed, the involvement was limited to the duodenal bulb.

These results furnished definite confirmatory proof of Rosenow's theory of elective localization and the infectious theory of peptic ulcer as well as of the theory that dental infection is an important factor in the causation of gastric and duodenal ulcer.

Holman [9] published in 1928 a comprehensive critical review of focal infection and elective localization and arrived at some interesting conclusions. While admitting that focal infection is a principle of great importance in numerous disease conditions in man, he said that the factors determining the localization of bacteria which have entered the blood stream are those which alter the circulation, particularly those which modify the endothelium of the capillaries and thereby affect the nutrition of the cells of the tissues concerned. He claimed that the specificity of the bacteria involved had not been proved and that the evidence favoring the theory of elective localization was still open to misinterpretation. It was recognized that a certain general bacterial adaptation to environment is accepted by every one but that the factors on the side of the host are more variable and therefore far more important. The final comment was rather significant and somewhat contradictory: "What Rosenow and all the other investigators of the problem have definitely demonstrated is that streptococci do localize in various organs and tissues and can produce lesions at least sufficiently suggestive of those found in man so that their potential danger in infected foci cannot be neglected."

One of the most carefully controlled experimental investigations supporting the concept of focal infection and elective localization was published by Noble W. Jones and S. J. Newsom [10] in 1932 and comprised the results of an interesting study of "experimentally produced focal (dental) infection in relation to cardiac structure." This was the first report on record of an experimentally controlled attempt to correlate the effect of focal infection with cardiac hypertrophy or to determine myocardial response to toxic injury and infection under stress and strain.

The problems discussed were (1) the relationship, if any, between experimentally produced focal (dental) infection and cardiac hypertrophy in dogs, (2) the relative effects of exercise on the hearts of infected and noninfected dogs, (3) the reliability of the various means of expressing cardiac hypertrophy and (4) other pathologic changes, cardiac and extracardiac, found in the experimental animals.

In the experiments twelve dogs had the distal half of a tooth removed. After the pulp was removed and the cavity dried it was filled with a culture of streptococci isolated from a patient with chronic hyperplastic sinusitis; the pulp point was put in place and covered with cotton and dental cement and the tooth permanently filled with silver amalgam. Twelve dogs were selected as a control group and subjected to the same care and treatment but were not inoculated. In addition, seven normal dogs of the same age and weight were secured after death; the free hearts were weighed and kept for comparative study.

The inoculated and control dogs were subjected alike to daily exercise in which the stress and strain was carried to the point of exhaustion. The results indicated that the inoculated dogs showed more fatigue than the noninoculated dogs during the period of exercise. They lost weight more rapidly and the average duration of life was shorter. These experiments furnished, therefore, considerable clinical evidence that the inoculated dogs were made chronically ill by reason of their dental infection. There was also a certain suggestive similarity in clinical course and pathologic changes between the inoculated dogs and human beings suffering from those myocardial changes that are believed to follow at times in the wake of chronic dental and chronic sinal infection.

The results were summarized as follows: 1. Dental abscesses were demonstrated in all inoculated dogs. 2. The hearts of the inoculated dogs all showed very small vegetative or verrucose mitral and/or aortic endocarditic lesions, patchy parenchymatous degeneration, nuclear changes, increase in the diameter of the muscle cells and slight round cell infiltration. 3. A positive relationship between experimentally produced focal dental infection and cardiac hypertrophy as measured by diameters of muscle cells was noted. 4. Stress and strain in the absence of focal infection did not affect the gross or the microscopic characteristics of the heart.

Such results so definitely controlled must be regarded as distinctly suggestive of selective tissue affinity and elective localization.

Within recent months an interesting clinical and experimental study of rheumatoid arthritis was presented by Cecil and Angevine,[11] with special reference to the incidence of focal infection. The study was based on an analysis of 200 cases of typical rheumatoid arthritis from the records of the private practice of Dr. Cecil. The sedimentation rate was accelerated in 93 per cent of the cases. The agglutination reaction with a strain of hemolytic streptococcus was strongly positive in 65 per cent. The experimental studies included the intravenous injection in small doses of a hemolytic strain of streptococci (2 cc.) which produced arthritis in about 85 per cent of the injected animals.

Using the same organism, these workers attempted to create foci in rabbits at various selected sites, such as the gums, sinuses, male genitalia, eyes, pleural and peritoneal cavities, joints, skin, uterus, fallopian tubes, renal pelvis and gallbladder. Arthritis was produced in only 11 per cent of 100 rabbits inoculated otherwise than intravenously, and to accomplish this end it was necessary to use large doses of a suitable strain of streptococcus as well as a most susceptible animal. It was concluded that as experimental foci the gums are a particularly favorable site for the absorption of bacteria and that it is difficult to establish a chronic persistent focus of infection in rabbits.

9. Holman, W. L.: Arch. Path. & Lab. Med. 5:69-136 (Jan.) 1928.
10. Jones, N. W., and Newsom, S. J.: Experimentally Produced Focal (Dental) Infection in Relation to Cardiac Structure, Arch. Path. 13: 392-414 (March) 1932.
11. Cecil, R. L., and Angevine, D. M.: Paper read before the American College of Physicians, April 4, 1933, at New York; to be published.

To the two investigators concerned these results seemed to indicate that chronic focal infection plays a comparatively unimportant part in typical rheumatoid arthritis. That the experimental foci produced in various tissues of rabbits can be regarded as analogous to conditions in the human organism is perhaps open to discussion.

About five years ago Rosenow and Jensen [12] announced the interesting fact that there is a close parallelism between elective localization and cataphoretic time and velocity of streptococci and that the respective serums have specific potential lowering effects on these streptococci. Rosenow [13] stated that the method of determining cataphoretic velocity has yielded results of etiologic importance and that if this method is properly applied it is no longer necessary to inject cultures from atria of infection intravenously into animals and to make cultures from their joints in order to be certain that the streptococcus isolated is causative or has characteristic infecting and antigenic powers. Determination of the cataphoretic velocity is usually sufficient.

Any impartial view of the mass of experimental and clinical studies that have been recorded must recognize that this evidence is supportive of the fundamental conception of an infectious process, in that many pathogenic bacteria possess a predilection for certain tissues. The pneumococcus is prone to localize in the lungs, and Bacillus typhosus has a definite predilection for the lymphoid elements of the gastrointestinal tract. The typhoid carrier offers a striking example of the chronic localized focus.

On the other hand, it is well established that organisms of the streptococcus group may invade almost any tissue of the human body and give rise to a great variety of pathologic changes. This was recognized by Forssner [14] as early as 1902, although the great importance of this elective tissue affinity was not recognized until many years later.

The results of the experiments which have been cited emphasize the importance of foci of infection as places in which bacteria may grow and acquire elective pathogenic properties which determine their mode of action and distribution after their entrance into the blood stream.

Within the inner circles of the bacteriologist and the immunologist, specific tissue affinity and elective localization are still subjects of controversy, yet the tenets of both sciences offer definite confirmation regarding this fundamental concept of focal infection, and perchance it is safe to assume that the "Rosenow heresy" may yet become the medical guide of the future.

CLINICAL OBSERVATIONS

Concurrently with experimental investigations, critical clinical observations in great numbers have been reported within the quarter century, and any impartial reviewer must admit that they lend the fullest support to the dictum spoken by Billings in 1932, twenty years after his original contribution: "Focal infection as an etiologic factor of general disease is now an established pathological principle."

The significant relationship of oral conditions to conditions elsewhere in the body is now widely recognized, for which fact no doubt the advances in the domain of dental medicine are in large measure responsible.

Focal infection implicating the nervous system has been emphasized by Foster Kennedy [15] and other neurologists, who point to the frequent occurrence of referred pain (myositic) with tonsillitis, the more limited incidence of transverse myelitis, the occurrence of peripheral neuritis and of neuritis of the cauda equina caused by various local infective foci, as well as the involvement of the nervous system in diphtheria.

MacCallan [16] of London has directed attention to the relation to ocular disease of chronic focal sepsis occurring in chronic inflammations of the intestinal tract, the gallbladder, the accessory sinuses, the prostatic urethra and the pelvic organs of the female, elimination of the infective focus producing a cure or improvement in the condition.

According to Ayers and Anderson [17] focal infection plays a dual role in dermatology, in that cutaneous disorders may act as foci of systemic infection and, vice versa, focal infection may be an important etiologic factor in diseases of the skin.

Harry Weiss [18] has recently analyzed 364 cases of subacute bacterial endocarditis with particular attention to antecedent history and the manner of onset. The chief feature noted was the frequency with which the onset was associated with an immediately preceding acute infection of the upper part of the respiratory tract, tonsillitis or influenza. Another significant fact was the frequency with which a preexisting pathologic condition of the endocardium was demonstrable. The frequency of antecedent cardiac disease, usually rheumatic but sometimes atherosclerotic, syphilitic or congenital, indicated that the infection required a previously diseased or abnormal endocardium on which to implant itself. The history of a tonsillectomy or extraction of a tooth often closely antedated the onset of symptoms. Infections of the genito-urinary tract, otitis media and wound infections were further sources of portals of entry.

William Hunter of London as early as 1910 directed attention to the causal relation of oral sepsis to secondary or hypochromic anemia. Murphy [19] has recently emphasized again the frequency of pyorrhea and dental abscesses in the early history of pernicious anemia. That such conditions have etiologic significance in the macrocytic anemias is being generally recognized. Chronic arthritis has always been closely associated with the concept of focal infection. While gonorrheal arthritis forms a classic demonstration and in many cases of chronic arthritis focal or other infections are accepted as the cause, there is still a strong belief that in all cases the disease is not due to this agency alone.

It has been suggested by Pemberton [20] and others that the pathologic changes of arthritis and the rheumatoid syndrome depend on disturbances in the blood supply of the parts involved, particularly the finer capillaries. With this opinion Billings [21] expressed his agreement shortly before his death in 1932 and recalled the statement in his early publications as to the prob-

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19. Murphy, W. P.: Lancet 1: 1451-1454 (June 27) 1936.
20. Pemberton, Ralph; Cajori, F. A., and Crouter, C. Y.: The Influence of Focal Infection, and the Pathology of Arthritis, J. A. M. A. 85: 1793-1798 (Dec. 3) 1925; 87: 2148-2151 (Dec. 25) 1926.
21. Billings, Frank: Bull. New York Acad. Med. 6: 759 (Dec.) 1930.

ability that hematogenous infection by bacterial emboli or their toxins is a large factor in the diminution of the circulation of blood, especially in the smaller blood vessels.

According to Irons [22] the current trend of thought concerning arthritis recognizes that the concept of chronic arthritis as a general disease rather than as a disease of the joints alone is steadily gaining ground. It is generally conceded that there are many initiating and contributing causes of chronic arthritis. These include infection, trauma, age, heredity, disturbances of the vascular supply or of the general and local nutrition, and metabolic and glandular dysfunction. No single cause or condition is common to all cases of arthritis.

In future etiologic studies the classification of chronic arthritis into two great types, the atrophic (rheumatoid) and the hypertrophic (osteo) arthritis, will be extremely serviceable, and the exact relationship of focal infection to arthritis, particularly the atrophic or rheumatoid type, will be more clearly understood.

COMMENT AND SUMMARY

In any attempted survey or evaluation of the present status of focal infection it must be evident that such infection has come to occupy a very important place in the activities of medical and surgical practice and of the various specialties.

It has been remarked that it has greatly enhanced the opportunities of certain specialists.

With increasing knowledge of the various phases of the problem a more conservative attitude has developed with reference to hasty diagnostic conclusions and radical removal of the suspected foci of infection, with added emphasis on a more careful analysis of all possible etiologic factors connected with the condition concerned. There is a growing conviction that treatment should be based on the results of an accurate and complete diagnosis, the physician remembering that it is the patient with a focal infection who requires treatment and not the focal infection alone.

It is well to recall the discussion of Billings [23] before the Section on Practice of Medicine in 1920, in which he said: "Focal infection as a cause of disease has come to stay. But, like every other principle in medicine, it has its limitations." He said further:

> Much of the fallacy and failure in the treatment or management of patients who suffer from what may be proved to be focal infection is due to the fact that the surgeon or physician in charge removes a focus, which may be the right one, and then neglects any further management of his patient. And, if, what I have just said is true, then the removal of the focus has not disturbed the organisms already in the tissues of the body. If you have removed the true focus, you have simply prevented the invasion of the tissues by additional organisms from the primary focus.

In spite of the critical attitude maintained in certain quarters regarding the continued acceptance of the concept of focal infection, it should be acknowledged that the efforts that have been proposed to detect and then to obliterate all forms of focal infection in the mouth and throat as well as elsewhere in the body for preventive as well as for curative purposes, besides being in accord with sound reasoning from general principles, has received the support of strong experimental evidence.

The constant correlation of experimental investigation with careful clinical observations has distinctly influenced diagnostic procedure for both the medical and the surgical specialist as well as for the general practitioner.

With a fuller appreciation of the limitations of special consultant service, the responsibility of the general internist or diagnostician has assumed a much greater importance. The correct interpretation of all the factors concerned with the causal relationship of focal infection to systemic disease requires diagnostic skill and judgment of a high order.

Perhaps the real contribution of the concept of focal infection is a fuller appreciation of the higher professional attributes involved in careful diagnostic conclusions and more complete treatment of patients, which are well exemplified in the life and service of Dr. Frank Billings.

Bankers Trust Building.

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FUNCTIONAL OR SOCIOLOGIC DISORDERS OF THE COLON

E. G. WAKEFIELD, M.D.
AND
CHARLES W. MAYO, M.D.
ROCHESTER, MINN.

Persons who have a functional disorder of the colon which may have been excited by social conditions describe symptoms which they believe arise in the colon, but when the colon is examined it is found to be free of physical changes which are indicative of organic disease. The disorder is manifested by irregularities of defecation and apparent alteration in the absorptive and secretory functions of the colon. It frequently is associated with abdominal discomfort, pain and often with mucus in the feces and subjective abdominal distention. Variations in these symptoms are the rule. However, the patient will rarely admit of periods without some "suffering." Changes in symptoms may be related to changes in the quantities of mucus present in the feces. Alternating periods of constipation and diarrhea are not uncommon, but the outstanding symptom usually is either diarrhea or a constipation.

Our object in this paper is to present what we think initiates a large part of the functional disorders of the colon during adult life and to tell how they may best be treated. If the exciting etiologic factor is intellectual and emotional weaknesses, one must show the patient his personal responsibility instead of resorting to the administration of placebos. Likewise, if the symptoms are due to unsuitable moral and religious tendencies or are the result of erroneous interpretations of defectiveness, disease or supposed misconduct of the colon, recovery may be attained only through mutual responsibility. The patient's confidence from the beginning is, therefore, of utmost importance. A patient may refer to the fact that his father and mother possessed beliefs or traits similar to his own and that he cannot be different. It is not true that what man is was foreordained when he got his supply of genes in the germ cells. Every person has many sets of possible heredi-

From the Division of Medicine (Dr. Wakefield) and the Division of Surgery (Dr. Mayo), the Mayo Clinic.
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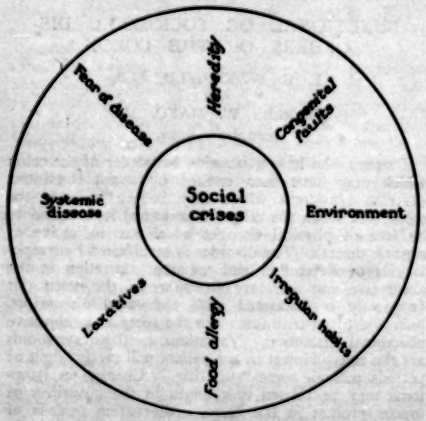
tary characters. The conditions under which he develops determine which set of characters he shall bring forth. It is the conditions which originated the belief that he is foredoomed that physicians may be able to modify. At some recent or remote time in the past history it usually will be found that insufficient rest, fear, anxiety or failure of relaxation has been operative. The beginning of the first serious disturbance of habit is often occasioned by sickness, accident, unexpected loss of money, property or job, or death of a member of the family, betrayal of confidence by a friend, migration, or change of party, church or occupation. The onset of a diarrhea or constipation at such a time is perplexing. This or that remedy is tried, and if no results are obtained the crises which originally initiated the insufficient rest and relaxation may be forgotten and the patient may become unadjusted socially on account of the colonic symptoms. He feels that the disease is organic in origin. Repetitions of crises may often occur, and the patient finally



Diagrammatic representation of etiology of sociologic diseases of the colon.

may become completely demoralized. All of this is important to the physician because intelligent management of the colonic disorders during a crisis will prevent many of the patients from becoming maladjusted and certainly will decrease the number of colonic invalids seen in the demoralized fraction of society.

ETIOLOGY

In order to facilitate description of the etiology of these disorders, the accompanying diagram has been arranged. The inner circle of the diagram should be considered as the hub of the etiology, and radiating from this hub, like the spokes of a wheel, are other factors which are exciting causes. Some such graphic arrangement aids greatly in a study and especially in obtaining a history and evaluating the symptoms, which are exceedingly important in the treatment of these disorders.

Systemic Disease.—The possibility of systemic disease must be considered in every case of functional disorder of the colon. Deficiency diseases such as pellagra and sprue must not be overlooked. Pernicious anemia with the associated achlorhydria, and chronic poisoning by lead or other heavy metals, exophthalmic goiter or Addison's disease all may be accompanied by intestinal symptoms which may be most difficult to evaluate and usually require careful study. Oftentimes, in cases of systemic disease, it is advisable to treat the patients as though they had a functional disorder of the colon until a definite diagnosis can be made. One should not jump to a diagnostic conclusion and institute unnecessary or possibly harmful treatment. Fevers, infectious diseases, septicemia, malnutrition from any cause, pelvic and abdominal tumors, and deranged functions of the pancreas, liver and kidneys are at times accompanied by colonic symptoms to such a degree that the underlying disease is masked.

Suggestion may be the basis for initiating a symptom. The suggestion may be obtained from conversation with one who actually suffers from organic disease of the colon. A symptom resulting from a suggestion made during consultation with a too casual physician or surgeon, or obtained from a patient who has an organic disease of the colon, may be most difficult to evaluate. One must remember that no patient lives unto himself. Whatever interrupts the smooth running of his personal affairs may be reflected by colonic symptoms.

Environment.—Environment exerts profound influence on all forms of life. Man has done much to stabilize the physical factors of his environment, but in doing this he has imposed on himself a most exacting competitive and machine-like routine of life. He lives by accounting for his time on time clocks, trading at bargain counters and paying his bills on the instalment plan. As though this mechanical existence were not enough, he is haunted by the desires and ambitions of his family. By contrasting this environment with the sulky existence of primitive man, without routine, who gained his power, influence and worldly possessions by means of the mace, one may gain an idea of the ever changing conditions in which the human species lives. Intrigue and politics are not physically dangerous but they may serve as effectively as the mace to produce disabilities. Environmental changes may be definitely derogatory. The girl from the carefree life of a home in the small town who is forced to earn her living away from home and live in cramped quarters with limited bathroom facilities is almost certain to become troubled with constipation. Environmental changes create social crises which are important etiologic factors in functional disorders.

Fear of Disease.—The fear of disease within certain limits is an important ideal for an individual or community. But when this fear grows big enough to interfere with daily life it may produce disability. Those who are fearful of disease of the colon are constantly tantalized by advertisements of remedies to prevent autointoxication and colitis. These advertisements may suggest unnecessary prophylactic care and unhygienic and unphysiologic requirements of the colon. Any fears of the patient should be treated with the greatest of caution and sympathy by the physician. A jocular attitude toward a fearful patient will often drive him into the hands of an apparently sympathetic person who may employ ill advised and infamous treatments which will result in the development of unmanageable fears and colonic disorders. At least an air of sympathy and a thorough examination are required as a beginning to convince the patient that

he does not have organic disease. In families in which disseminated polyposis or carcinoma of the colon or rectum, or ulcerative colitis, has occurred, a fear of these diseases is genuine. This fear is often precipitated by the presence of mucus in the feces. Mucus is a normal but variable secretion of the colon and not a sign of disease.

The patients who suffer from a disorder of the colon which results from the fear of disease of the colon or elsewhere in the body may be classified in two groups. The first group comprises those who are intelligent and who have a good, sound basis for their fear, such as an unexplained diarrhea, following a recent pulmonary tuberculosis or time spent in a tropical climate. The patients in this group are temporarily unadjusted and will recover if proper advice is given by the physician. The second group includes patients whose judgment is fallacious. Their conception is that they have a disorder of the bowels; their complaints and their "case" are different from any they imagine that the physician has ever seen. They are worthless to themselves, miserable, arrogant, evasive and difficult, if not impossible to treat successfully.

Laxatives.—The use of laxatives is as old as the human race itself. A good laxative gave the early physicians a means of producing results which demonstrated to the patient the potency of their medicine. When the colon has been emptied with a laxative, it becomes filled with liquid feces and gas. If there is any tendency to irritability, the presence of the gas and fluid may produce discomfort. It is doubtful, however, whether the repeated use of laxatives by normal persons will produce anything more than a mild functional disorder of the colon which will subside as soon as the purgation is discontinued. The habitual user of purgatives punishes the colon because of erroneous ideas of its proper function.

No part of the etiology of functional disorders of the colon has received more attention than that of laxatives. The question may be justly asked whether the laxative habit precedes or follows the disorder. The continued and increasing use of drugs to produce defecation is so obviously injurious that it needs no elaboration to the physician.

One of the oldest and most popularized theories of the cause of functional disorders of the colon assumes that retained alimentary waste materials produce toxins, which in turn are absorbed by the intestine and thus poison the body. Scientific data which will either prove or disprove this theory are lacking. Indican in the urine has been assumed to be an index of "colonic stasis." Indican is a conjugated sulfate, indoxyl sulfuric acid. This fact alone would indicate that the possible toxic effects of indoxyl probably have been quickly and effectively neutralized by being conjugated with sulfuric acid.

Congenital Faults.—Congenital faults in the development of the colon conceivably could be of etiologic importance in a functional disorder. It, however has been the experience of all careful observers that congenital malformations do not produce symptoms that are as indefinite and as obscure as those often present in a functional disorder. If one began to theorize that a faulty development of the intestine or colon was etiologically important, objection to this theory could be raised on the basis that congenital malformations and variations are always present. What is more important is the fact that a congenital fault often could not be proved to be a developmental defect but a hereditary pattern. We believe that variation in the length or position, or ptosis of the colon is compatible with a comfortable abdomen and bowel habits. We do not believe that the erect position of man produces digestive handicaps.

Allergy to Food.—Much research and thought have been directed toward solving the important problem of allergy to certain foods. Those who are too sympathetic toward the idea of food allergy vision an allergy to some food in every case of indefinite abdominal symptoms. Of the total number of patients who have these symptoms, relatively few will respond favorably to the so-called elimination diets or will respond positively to dermal tests with food extracts. Allergy, if considered on a sound scientific basis, follows certain definite clinical trends. If the patient is allergic, he should have symptoms which can be explained on the basis of spasm by smooth muscle, other manifestations of allergy should be present, a positive family history for allergy should be obtainable, the cutaneous tests for allergy should be positive, and eosinophilia should be present.

The results produced by an elimination diet have no objective controls. The physician is forced to interpret the subjective discourses of a patient whose disorder is characterized by vague descriptions and often by fabrications and evasiveness. One tries to evaluate the effects of foods on symptoms which are often figments of the imagination, and above all sitophobia may be an important symptom. Where sitophobia is present, good results will be obtained with the initial diet, but the further addition of foods inevitably produces distress and suffering. Often so-called food allergies are produced by eating quickly or, in other words, by "bolting food" at irregular hours. Such abuses often promote physical and mental abuses and excuses for excessive use of tobacco, coffee and alcohol.

Irregular Habits.—Some of the irregular habits conducive to the production of functional disorders of the colon have been mentioned. The largely artificial environment created by what we call our present civilization makes no allowance for the creation of regular bowel habits except the provision of toilet seats which are too high for a comfortable natural defecation. A certain degree of relaxation during work, sleep and periods of full relaxation, such as obtained while on a suitable vacation, are necessary and, if obtained, the question of bowel habits would not be known except during the unavoidable social crises during a lifetime. Irregularity prevents relaxation and annuls sensations. When there is an increased number of bowel movements during the day, regular habits for meals, without extreme temperatures of foods and beverages, may be beneficial. In cases in which there is an increased gastrocolic reflex, a change in the hour of the morning meal, as well as slowly eating of foods at about body temperature, is imperative. Many vicious habits of eating, sleeping, defecation and work are absolutely unrecognized by the patient. These can be ascertained only by taking a detailed clinical history.

Heredity.—Barring accident, when one is born one is endowed with potential capabilities, mentally and physically. These capabilities are mixtures of those possessed by one's progenitors. One's mental habits, conduct, hours of sleep, foods and drinks are intimately associated with one's environment, but they may be closely related to physical endowments of heredity. Of

the physical endowments of heredity, that of stature seems to be of the greatest importance, for a sturdy blond rarely has a sociologic disorder of the colon; typically it affects the tall, slender brunet. At birth one either possesses the type of nervous system of the stoic or that of the "nervous" irritable person. Environment with its harmful or beneficial influences yields what the physician has to work with. One cannot avoid the impression that a proper physical and social environment would prevent the physician from seeing many of these unfortunate persons.

SYMPTOMS AND PHYSICAL SIGNS

The clinical history of a functional disorder of the colon may subjectively reveal the presence of every known symptom which can arise from organic disease of the colon. The bowel habits range from profound constipation to watery diarrhea. Often these symptoms alternate from a watery diarrhea to a stubborn constipation.

The diarrheal phase is the most distressing. It is likely to cause the greatest inconvenience after breakfast. Secretion of mucus, which is one of the principal functions of the colon, may be deranged so that small quantities are passed with each bowel movement, or an entire bowel movement may consist of mucus. The patient often is led to believe that worms have been passed. Mucus is frequently white and stringy and presents pseudomovements as a result of drying.

In eliciting the history, there are certain facts to be ascertained. Organic disease is likely to be ushered in with fever, loss of weight and perhaps blood in the stool. A functional disorder arises during or following the stress and strain of a social crisis. When the symptoms are intermittent, exacerbations come during subsequent crises. In some cases, when the environment has not changed the symptoms become constant. When the patients live in normal environments, a social crisis produces a permanent maladjustment and thus causes constant symptoms. The symptoms of organic disease are likely to be progressive or cease to exist.

The results of general physical examination in any phase of this disorder are not characteristic. Many normal persons have a palpable cecum, ascending colon or sigmoid colon. Abdominal tenderness may be accompanied by hypersensitiveness to pressure throughout the body. Often there are hyperactive reflexes, a tendency to fabrication, evasiveness, arrogance, irritability, and fixed and usually erroneous ideas concerning the illness. It is important to remember that organic disease may coexist or be superimposed on a functional disorder of the colon.

DIAGNOSIS

The diagnosis of a functional disorder of the colon depends on the following criteria: 1. Three specimens of fresh liquid feces obtained, if necessary, by the administration of saline purgatives should not contain ova or parasites. 2. Proctoscopic and sigmoidoscopic examination should reveal a normal mucosa and normal mobility of the bowel. 3. Roentgenologic examination of the colon and terminal portion of the ileum by means of an opaque enema, after adequate preparation, should not disclose any abnormality (if the ileocecal segment of the bowel is not visualized it may be necessary to administer the opaque medium orally). 4. Free hydrochloric acid should be present in the gastric contents after administration of a test meal. 5. The basal metabolic rate should be within normal limits. The last two of these examinations are not necessarily routine. The judgment of the examiner must be relied on in determining the necessity for further examinations to rule out endocrine disturbances, just as for the necessity of other special tests, such as cutaneous tests for possible allergy, and examination of the blood and urine for detection of possible poisoning with heavy metals. That is, the diagnosis is made by the process of elimination.

TREATMENT

At this time suggestions on therapy will be specially applicable to young and middle-aged adults. Therapeusis by drugs resolves itself into the treatment of diarrhea and constipation.

In phases of constipation, the only laxative which should be used is one that acts by forming a nonirritating bulk. Crude or flake agar in doses of from 1 to 4 ounces (30 to 120 Gm.) administered in cereal or milk is the most reliable.

The success of treatment of diarrhea depends on acquainting the patient with his reactions and the effects of a social crisis. He should be made to understand that the colonic discomforts are reflex phenomena and not the result of an organic disease. One should prescribe few drugs during the crisis, but the patient should be made to rest and relax and an attempt should be made to allay the anxiety. These measures are best accomplished by a regimen aimed toward physical rehabilitation. In brief, at the onset of the disorder a simple outline which aims at regularity of habits, meals, bowel movements and exercise is the treatment of choice. If the disorder is chronic or if the patient is socially maladjusted, treatment should not be started until the patient has been convinced that all efforts to discover latent disease have been exhausted. Fixed ideas concerning the illness, and arrogance and evasiveness are often a part of the disorder when it has become chronic. Therapeutic success is directly proportional to the degree of these symptoms, which may be used as indexes of the patient's ability to make social readjustments.

The treatment of the symptom diarrhea consists of the administration of drugs by mouth or by rectum and the control of the intake of food and fluids. The drugs which may be administered orally may be considered under several headings. The best drugs for lessening bowel movements are the alkaloids of opium. It is rarely justifiable to administer these drugs. Of the opiates, tincture of opium is the best. It should be administered three or four times daily in doses of 5 minims (0.3 cc.). However, some patients prefer camphorated tincture of opium, which should be administered in doses of 1 drachm (4 cc.). The tannic acid series and the mucilaginous herbs are the active substance in all folklore and Indian remedies for intestinal disorders. Lime water, lead acetate, bismuth subnitrate and atropine have enjoyed unwarranted popularity. Reasonable quantities of any known drug cannot be expected to pass through the buffers of the intestine and act effectively in the colon. Inert clays, ground to colloidal proportions, might be effective if sufficiently large doses could be given. An effective dose of the "powders" always absorbs sufficient material from the twenty feet of small intestine before reaching the colon to render it inactive. However, powders such as bismuth subnitrate (in teaspoonful doses) may have definite psychic value. Before attributing therapeutic

value to a drug in diarrhea, it must be recalled that this condition usually subsides spontaneously. In cases in which it is associated with achlorhydria, dilute hydrochloric acid in doses of from one-half to 1 drachm (2 to 4 cc.) should be administered by mouth (sipped through a glass tube). Tincture of iodine in doses of 10 minims (0.65 cc.) in a full glass of water may be effective. Systemic sedatives are often required and may be most valuable. Of these, either phenobarbital or the elixir of triple bromides is the safest. One-half grain (0.032 Gm.) of phenobarbital may be given three or four times daily. Fifteen grains of bromides may be given three or four times daily.

Except when they have severe diarrhea, patients should be placed on a wholesome normal dietary regimen. The human digestive system is structurally unfitted for the digestion of cellulose. If indigestible residue, such as wheat bran, is ingested, it will produce bowel movements for a short time until the colon becomes adjusted to the new stimulus. If the dietary and therapeutic regimens are changed too frequently the colon is required to change its habits. This change in habit is opposed to ideal treatment. A basic principle in ideal treatment is a regularity of habits, with periods of rest and relaxation which are strictly enforced. To this regimen should be added harmless remedies and other measures that are required to satisfy the patient.

The regular intake of water is often beneficial. These patients should receive enough water so that after the morning specimen of urine is voided the urine is practically without color the rest of the day. There is no reason to restrict the intake of salt. In the presence of severe diarrhea, the patient may become dehydrated and it may be imperative to maintain an increased intake of salt and water. If it is impossible to maintain normal urinary excretion by the oral administration of water and physiologic solution of sodium chloride, the deficit of water and salt should be made up by intravenous injections of physiologic solution of sodium chloride. During acute diarrhea, abdominal cramps often occur. The frequent passage of watery stools may irritate the anus, which becomes sore and painful. The application of heat to the abdomen and perineum is desirable. Rectal suppositories are usually not effective because they are expelled immediately. If the appetite is capricious, between-meal feeding may aid in maintaining sufficient caloric intake. In this state of hyperirritability of the intestine the diarrhea may stop abruptly. Rectal instillation of 2 or 3 ounces (from 60 to 90 cc.) of warm olive oil twice daily and the administration of sufficient tincture of belladonna to produce pharmacologic effects, which are evidenced by dryness of mouth and throat, may aid in restoring intestinal function.

In a few cases the history will reveal that during a phase of constipation repeated purgation, daily enemas or colonic irrigations had been prescribed. At first such a regimen had produced considerable relief, but later the abdominal pain and constipation had become more obstinate and finally an operation had been performed. At the time of the operation only chronic appendicitis or adhesions had been found. After the operation there had not been any discomfort for a short time and then there had been a recurrence of the abdominal pain and constipation. Such a history is very perplexing because the abdomen has been opened one or more times and there is the possiblity of a mechanical ileus. Such a case requires most serious consideration because the syndrome of spastic ileus usually should not be treated surgically.

A spastic ileus is generally a benign affliction. It usually affects those who have functional colonic disorders. Patients have died of a spastic ileus which had been treated with and without operation. There is no way to determine what the outcome would have been in any one case if another procedure had been resorted to. The difficulty lies in the fact that the clinical symptoms of mechanical and spastic ileus are the same. In both cases the illness may be acute or chronic, and the mischief may be situated in any segment of the intestine. There are two important differential points in making a clinical diagnosis. The first is the condition of the patient. In spastic ileus the general condition of the patient remains good for a long time, while in mechanical obstruction the patient may fail rapidly. A spastic ileus is likely to subside spontaneously in a short time. The second point is the duration of symptoms. Spastic ileus most commonly affects patients who have had a functional disorder of the colon. In our experience, spastic ileus most frequently affects patients who have been energetically treated by enemas, by strong purgatives and often by colonic irrigations. The previous history and treatment are not safe criteria for making an immediate decision as to the correct therapy. Such criteria can serve only as secondary aids in deciding on the proper course to pursue. It also is recognized that if it always were possible to make a diagnosis of spastic ileus the treatment should not be the same. Spastic ileus may be initiated in otherwise normal persons by foreign bodies, worms, undigested food, hemorrhage, circulatory disturbances, and reflexly by diseases of the central nervous system and perhaps at times by other indefinite causes. Treatment of these conditions cannot be outlined; it falls into the field of emergency medical treatment and, as long as the patient's general condition is good, one should not resort to operation.

Surgical treatment of the functional disorders of the colon, as an adjunct to rational therapy, is definitely contraindicated. When operation is performed in the absence of organic disease, it denotes an error in surgical judgment. There is much misconception relative to the importance of ptosis as an important factor in these disorders, and surgical procedures have not infrequently been advocated and performed with varying degrees of success, depending rather on the honesty of the surgeon than on the necessity of the procedure. Success of operation, in other words, has not been noteworthy.

A patient with a functional disorder of the colon may require surgical intervention for other abdominal disease, and fine differential diagnostic judgment is often required in such cases. When it is necessary to operate under these circumstances, it is important to make sure that the patient understands that the proposed operation is not intended to alleviate those abdominal symptoms referable to the functional disease. Surgical advice, therefore, in functional diseases of the colon consists, for the most part, of advice against surgical intervention.

SUMMARY

It is evident that the cure of these functional disorders is not to be sought merely in certain dietary rearrangements but in attempts to control scientifically the adverse social conditions. This is not always possi-

ble because many patients, from the standpoint of heredity, are incapable of meeting the exigencies of life and are therefore socially pathologic. In order to eliminate these disorders, the defects in education, government, religion, morality, philanthropy and even physical heredity have to be corrected. This ideal may be approached when there is a scientific understanding of the conditions necessary for normal social life. This ideal will never be attained by treating these patients for "colitis." It is only necessary to say in conclusion that the wisest measures should be directed toward the prevention of these disorders as well as toward the reclaiming of those who have already been caught in their meshes.

THE TREATMENT OF RHEUMATOID ARTHRITIS WITH LARGE DOSES OF VITAMIN D

A CRITICAL EVALUATION

NATHAN R. ABRAMS, M.D.
AND
WALTER BAUER, M.D.
BOSTON

In 1935 Dreyer and Reed [1] reported that they had previously observed [2] marked clinical improvement in the rheumatoid arthritis of two patients during the time they were receiving massive doses of vitamin D for hay fever. This original report and other reports by the same authors [3] have resulted in an increasing interest in the value of vitamin D in the treatment of rheumatoid arthritis as shown by subsequent reports.[4]

Knowing that generalized decalcification is a common and at times an early manifestation of rheumatoid arthritis, one might be led to suspect that the chance observation of Dreyer and his co-workers [5] indicated that certain patients with rheumatoid arthritis suffer from some type of disease of calcium and phosphorus deficiency. If such were the case, then this chance observation might be of etiologic as well as of therapeutic significance. However, detailed studies of the calcium and phosphorus metabolism of patients with rheumatoid arthritis have failed to reveal metabolic changes of sufficient degree to allow one to conclude that the generalized decalcification is secondary to a primary disturbance of calcium and phosphorus metabolism.[6] This being true, one might conclude a priori that any improvement noted in patients following the administration of vitamin D was not the result of correcting a previously existing alteration of the calcium and phosphorus metabolism. An additional reason for doubting that such is not the modus operandi of massive doses of vitamin D is suggested by our failure to observe any material alteration in the course of the disease in patients receiving from 5,000 to 15,000 U. S. P. units of vitamin D daily for as long as from six to thirty months.[7] This dose of vitamin D, although not adequate for the cure of all diseases of calcium and phosphorus deficiency, is sufficiently large to correct a good percentage of them.[8]

Irrespective of the aforementioned facts, Dreyer and Reed [1] reported improvement in twenty-five of thirty-four patients with rheumatoid arthritis treated with large doses of vitamin D, and others [9] have reported equally encouraging results. Some reports [10] have been less enthusiastic. Other workers [11] have stated that further trial with this form of therapy is necessary before any final conclusions are drawn concerning its efficacy. The results obtained by previous workers are briefly summarized in table 1.

METHOD OF STUDY

Because of the therapeutic and etiologic significance that might be attached to the foregoing reports concerning a chronic disease of unknown etiology, it was deemed necessary to evaluate as critically as possible the therapeutic effectiveness of massive doses of vitamin D in the treatment of patients with rheumatoid arthritis. Since rheumatoid arthritis is a chronic disease of years' duration, characterized by remissions and relapses of varying length and degree, the course of the disease may vary considerably from patient to patient. Therefore, in a study of this type, designed to determine the therapeutic effectiveness of a particular form of therapy, one must of necessity require that each person serve as his own control. Only in this way can one determine whether or not the therapy has altered the course of the disease. If this precaution is not taken, one will all too frequently conclude that the observed improvement is the result of the therapy employed, whereas it may represent nothing more than a natural fluctuation in the course of the disease. This manner of controlled study can best be accomplished by choosing only those patients whose clinical course has been known for months or years on a constant regimen prior to the institution of any so-called specific form of therapy. Equally important in this type of study is an adequate follow-up period on the same

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From the Medical Clinic of the Massachusetts General Hospital, the Department of Medicine, Harvard Medical School, and the Massachusetts Department of Public Health.

1. Dreyer, Irving, and Reed, C. I.: The Treatment of Arthritis with Massive Doses of Vitamin D, Arch. Phys. Therapy 16:537 (Sept.) 1935.
2. Rappaport, B. Z., and Reed, C. I.: Vitamin D of High Potency in Seasonal Hay Fever and Related Conditions, J. A. M. A. 103:105 (July 6) 1933.
3. Reed, C. I.: Irradiated Ergosterol—Clinical and Experimental Studies, Arch. Phys. Therapy 15:69 (Feb.) 1934. Rappaport, B. Z.; Reed, C. I.; Hathaway, M. L., and Struck, H. C.: The Treatment of Hay Fever and Asthma with Vitamin D of High Potency, J. Allergy 6:541 (Sept.) 1935. Reed, C. I.: Symptoms of Vitamin D Overdosage in Human Subjects, J. A. M. A. 103:1745 (May 26) 1934.
4. These include:
Livingston, S. K.: Vitamin D and Fever Therapy in Chronic Arthritis, Arch. Phys. Therapy 17:704 (Nov.) 1936.
Vriesk, E. G., and Lang, R. S.: Observations on the Treatment of Chronic Arthritis with Vitamin D, J. A. M. A. 106:1162 (April 4) 1936.
Holbrook, W. P., and Hill, D. F.: Treatment of Atrophic Arthritis, J. A. M. A. 107:34 (July 4) 1936.
Wyatt, B. L.; Hicks, E. A., and Thompson, H. E.: Massive Doses of Vitamin D in the Treatment of Proliferative Arthritis, Ann. Int. Med. 10:534 (Oct.) 1936.
Furley, R. T.: Management of Arthritis, Illinois M. J. 71:74 (Jan.) 1937.
Steck, I. E.: Clinical Experience in the Treatment of Arthritis with Massive Doses of Vitamin D, Ibid. 71:243 (March) 1937.
Steck, I. E.; Deutsch, H.; Reed, C. I., and Struck, H. C.: Further Studies on Intoxication with Vitamin D, Ann. Int. Med. 10:951 (Jan.) 1937.
Hench, P. S.; Bauer, Walter; Christ, David; Hall, Francis; Holbrook, W. P.; Key, J. A., and Slocumb, C. H.: The Present Status of Rheumatism and Arthritis: Review of American and English Literature for 1936, Ann. Int. Med. 11:1089 (Jan.) 1938.
5. Dreyer and Reed.[1] Rappaport and Reed.[2] Reed.[3] Rappaport, Reed, Hathaway and Struck.[3]
6. Bauer, Walter, and Reyes, M.: Unpublished data.
7. Bauer, Walter, and Short, C. L.: Unpublished data.
8. Bauer, Walter: The Parathyroid Glands in Health and Disease, Virginia M. Monthly 65:123 (June) 1938. Miller, L. M., and Fong, C. T.: Calcium and Phosphorus Metabolism in Osteomalacia, J. Exper. Med. 42:137 (Jan.) 1925.
9. Livingston,[4] Furley,[4] Steck.[4]
10. Vriesk and Lang,[4] Holbrook and Hill,[4] Wyatt, Hicks and Thompson.[4]
11. Holbrook and Hill,[4] Hench, Bauer, Christ, Hall, Holbrook, Key and Slocumb.[5]

constant regimen employed prior to the institution of the form of therapy being studied. If each patient studied is so controlled, then one is best able to conclude whether the observed improvement or alteration in the course of the disease during and after treatment represents a therapeutic effect, a chance remission or the natural course of the disease. In all fairness to the form of therapy being studied, one should choose patients whose disease process is reversible. Any therapeutic measure employed in the treatment of rheumatoid arthritis should effect clinical improvement with great regularity in most patients before one has the right to suspect that one is dealing with a specific therapeutic therapy was being employed. It is extremely difficult to draw conclusions from much of the data presented in the reports concerning the therapeutic effectiveness of large doses of vitamin D in rheumatoid arthritis because the patients were not rigidly controlled and the degree of improvement was not accurately recorded.

We have observed eighteen patients with typical rheumatoid arthritis prior to, during and after the administration of large doses of vitamin D. Only five (66, 90, 286, 328 and J. H.) of the eighteen patients were hospitalized during the period of treatment. From table 2 one notes that in all instances the arthritis was in a stationary or progressive state prior to the insti-

TABLE 1.—*Results Observed by Other Authors Following the Administration of Massive Doses of Vitamin D to Patients with Rheumatoid Arthritis*

Authors	Number of Patients	Daily Dose (U. S. P. Units)	Duration of Therapy	Other Measures Used	Per Cent Improved	Authors' Comments
Dreyer and Reed [1]	34*	200,000-300,000 occasionally up to 1,000,000	Not stated	Not stated	73†	Improvement evidenced locally by diminution of swelling and pain in the joints as well as by increased motion of the joints; general improvement consisted of improved nutritive state; greater muscular strength, less fatigability, improved gastrointestinal function and decreased vasomotor instability; "toxic symptoms often present without hypercalcemia"; "hypercalcemia often without associated toxicity"
Livingston [4]	14	200,000-600,000	"Continued over an indefinite period of time"	Fever therapy in 9 cases	86‡	Improvement noted similar to that reported by Dreyer and Reed [1]; sedimentation rates reduced; "toxicity not associated with hypercalcemia"; "fever therapy in conjunction with vitamin D caused more rapid clinical improvement than vitamin D alone"
Farley [6]	27§	200,000-600,000 in one case 1,000,000	Not stated	"Fever therapy in some"	100	Some patients treated for first time; others had received treatment elsewhere for as long as 3 to 6 years without benefit; decrease in pain, increased motion of the joints and improved nutritional state were observed; sedimentation rates lowered; roentgenograms showed recalcification of bone and reconstruction of cartilage
Vrtiak and Lang [8]	20	150,000-250,000	Average: In markedly improved group—4 months; moderately improved—10 months; slightly improved—7½ months; unimproved—9¼ months	Not stated	60 (5 cases marked, 6 moderate, 4 slight)	Roentgenograms taken following completion of therapy failed to reveal increased bone density (5 cases); concluded that results are similar to those obtained with other forms of therapy; therefore believe conservative attitude should be maintained before vitamin D is accepted as a specific form of therapy
Wyatt, Hicks and Thompson [9]	40	200,000-300,000	Not stated	General measures	20	Patients under observation for at least 6 months prior to treatment; improvement determined by bettered general physical status, decreased signs and symptoms of the joints; sedimentation rates, morphologic blood pictures, agglutination reactions for streptococci and serum calcium and phosphorus values were followed
Stock [5]	18	Usually 150,000-300,000 (some higher)	6 months' trial (with rest periods); continued beyond if improved	General measures	"75-80% can be benefited"	Noted improvement similar to that described by Dreyer and Reed [1]; also, decreased sedimentation rates and increased red blood cell counts; roentgenograms showed recalcification of bones
Holbrook and Hill [3]	25	200,000-300,000	4 months	General measures	?	Noted less pain in 5 patients and marked reduction in sedimentation rates in 4; authors state that sufficient time has not elapsed to evaluate therapy
Bench et al.[2]	"About 25"	250,000-600,000	1-2 years	Not stated	?	"Reduction in pain and soreness, and increase in well being in some patients; little change in articular lesions"

* Three other cases were listed as "mixed." These included one "infectious and gonorrheal" and two "menopausal and rheumatoid." Two of these three patients improved.
† Results in three cases listed as "still uncertain."
‡ Improvement in four of the five patients treated with vitamin D alone, whereas eight of the patients treated with fever therapy in addition improved.
§ Author included all types of arthritis.
‖ Number of patients treated not stated.

agent. In studies of this type it is equally important to record improvement as accurately as possible by every available method. This is best accomplished by recording separately subjective, objective and laboratory evidence of improvement as well as grading the final result on the basis of all three. This method of appraisal enables one to evaluate more accurately any psychic effect, such as is so frequently encountered in patients with chronic disease following the institution of any new form of therapy.

Failure to consider these many facts in times past has been responsible for many premature therapeutic and etiologic claims, the inspiring of false hope in patients at great financial expense and at times progression of the disease because a good general regimen was not adhered to during the time the new form of tution of vitamin D therapy. It will be further noted that the duration of the arthritis, its severity and the extent of involvement varied from patient to patient. The observed therapeutic effects are recorded separately as subjective improvement, objective improvement, fluctuation in weight and alteration in the corrected sedimentation rate [12] as well as the total end result. Determinations of fasting serum calcium,[13] serum phosphorus [14] and serum phosphatase [15] were made every

12. Rourke, M. D., and Ernstene, A. C.: A Method for Correcting the Erythrocyte Sedimentation Rate for Variations in the Cell Volume Percentage of Blood, J. Clin. Investigation **9**:543 (June) 1930.
13. Fiske, C. H.: Method for Calcium Determination, Unpublished data.
14. Fiske, C. H., and Subbarow, Y.: The Colorimetric Determination of Phosphorus, J. Biol. Chem. **66**:375 (Dec.) 1925.
15. Bodansky, Aaron: Phosphatase Studies. II. Determination of Serum Phosphatase. Factors Influencing the Accuracy of the Determination, J. Biol. Chem. **101**:93 (June) 1933.

TABLE 2.—*Description of Patients with Rheumatoid Arthritis and*

Case;* Sex; Age, Years	Characterization of Arthritis: Duration of Disease	Extent of Involvement	Activity of Disease	Total Severity	Time Observed Before Therapy	Course During Pretreatment Period	Daily Dose of Vitamin D (U. S. P. Units)†	Duration of Therapy	Sedimentation Rates, Mm. per Min.: Just Prior to Therapy	During Therapy	Following Therapy
32 ♀, 28	5 yrs.	Moderate	Moderate	Moderate	4½ yrs.	Slowly progressive	80,000 to 200,000‡	13 mos.	Low 0.68 High 1.11 Last 0.82	Low 0.45 High 0.86 Last 0.45	Not done
40 ♀, 61	7 yrs.	Extensive	Moderate	Moderate	4 yrs.	Stationary except for mild partial remission	60,000 to 160,000	7 wks.	Low 1.08 High 1.42 Last 1.19	Low 0.56 High 1.29 Last 1.14	1.13-1.15 (4 mos.)
41 ♀, 64	8 yrs.	Mild	Mild	Mild	4 yrs.	Very slowly progressive	(a) 20,000 to 160,000	5 mos.	Low 0.73 High 0.98 Last 0.65	Low 0.69 High 1.11 Last 0.68	0.69 (2 mos.)
							(b) 160,000 to 220,000	5 wks.		No rates done	
66 ♀, 17	9 yrs.	Mild	Moderate	Moderate	2 yrs.	Stationary	20,000 to 80,000	3 mos.	Low 1.04 High 1.97 Last 1.62	Low 1.48 High 1.56 Last 1.56	1.68 (9 mos.)
90 ♀, 40	7 yrs.	Moderate	Moderate	Moderate	2 yrs.	Slowly progressive	20,000 to 160,000	4 mos.	Low 1.67 High 1.94 Last 1.94	Low 1.24 High 1.70 Last 1.70	1.62-1.86 (15 mos.)
120 ♂, 51	4 yrs.	Extensive	Marked	Severe	2 yrs.	Occasional periods of slight improvement; on the whole, stationary	20,000 to 160,000	10 mos.	Low 1.02 High 1.89 Last 1.59	Low 1.21 High 1.65 Last 1.21	1.38-1.52 (5 mos.)
127 ♂, 36	10 yrs.	Extensive	Moderate	Moderate	4 yrs.	Slight progression of disease	80,000 to 160,000	15 wks.	Low 0.75 High 1.31 Last 1.25	Low 1.12 High 1.19 Last 1.12	1.04 (7 mos.)
181§ ♀, 29	7 yrs.	Mild	Mild	Mild	5 yrs.	Many good and bad periods; on the whole, stationary	80,000 to 160,000	11 mos.	Low 1.50 High 1.91 Last 1.52	Low 1.20 High 1.95 Last 1.95	1.63-1.43 (4 mos.)
194 ♂, 51	3 yrs.	Extensive	Moderate	Moderate	1½ yrs.	Practically stationary; at times, slight improvement	80,000 to 160,000	8½ mos.	Low 1.79 High 2.62 Last 1.96	Low 0.96 High 1.90 Last 1.90	1.45-1.58 (7 mos.)
221§ ♂, 60	25 yrs.	Mild	Marked	Severe	3 yrs.	Slowly progressive	80,000 to 160,000‡	8 mos.¶	Low 1.25 High 1.68 Last 1.25	Low 1.11 High 1.64 Last 1.63	1.48-1.39 (6 mos.)
224§ ♀, 49	7 yrs.	Mild	Moderate	Moderate	4 yrs.	Slowly progressive	80,000 to 160,000	6 mos.	Low 0.68 High 1.12 Last 1.12	Low 0.53 High 0.84 Last 0.53	0.70 (7 mos.)
286 ♀, 21	5 yrs.	Moderate	Moderate	Moderate	6 mos.	Slowly progressive	(a) 40,000 to 200,000	3½ mos.	Low 1.42 High 1.60 Last 1.32	Low 0.83 High 1.03 Last 1.03	1.04-1.48 (5 mos.)
286	Because of relapse, treatment resumed 12 months later						(b) 120,000 to 300,000‡	4 mos.	Low 0.94 High 1.51 Last 1.22	Low 0.62 High 1.22 Last 0.63	0.84 (2+ mos.)
325 ♂, 42	6 yrs.	Extensive	Marked	Moderate	3 mos.	Stationary	80,000 to 160,000	1 yr.	Low 0.63 High 1.61 Last 0.63	Low 0.75 High 1.60 Last 1.60	Not done
335 ♀, 50	1 yr.	Extensive	Marked	Severe	2 mos.	Stationary	45,000 to 60,000	6 mos.	Low 1.15 High 1.45 Last 1.38	Low 0.78 High 1.62 Last 1.34	1.59-0.92 (2 mos.)
J. H. ♀, 11	2 yrs.	Moderate	Moderate	Moderate	6 mos.	Slowly progressive	45,000 to 60,000	3 mos.	Low 0.53 High 0.70 Last 0.56	Low 0.53 High 0.82 Last 0.67	0.68-0.79 (1½ mos.)
A. A. B.‖ ♂, 51	8 mos.	Extensive	Marked	Severe	6 mos.	Rapidly progressive	140,000 to 160,000	3 mos.	Low 1.59 High 1.78 Last 1.78	Low 1.58 High 1.72 Last 1.69	1.69-1.81 (5 mos.)
F. D.‖ ♀, 38	5 mos.	Mild	Mild	Mild	1 mo.	Slowly progressive	60,000 to 80,000	13 mos.	Low 0.63 High 0.81 Last 0.77	Low 0.59 High 0.72 Last 0.59	0.61-0.85 (3 mos.)
C. M.‖ ♀, 60	5 mos.	Moderate	Moderate	Moderate	5 mos.	Slowly progressive	250,000‡	6 mos.	Low 1.07 High 0.74 Last 1.00	Low 0.84 High 1.04 Last 1.15	1.17-0.98 (6 mos.)

* The numbers listed here refer to the patients with rheumatoid arthritis who have been studied in detail and have been reported on in the past. These patients will be referred to by the same number in the detailed publications concerning rheumatoid arthritis which will appear later.

† These cases have been reported by the same number in the paper entitled "The Treatment of Rheumatoid Arthritis with Colloidal Sulfur."

‡ This patient experienced complete remission for eighteen years. Present attack of seven years' duration.

Results Observed Following Treatment with Large Doses of Vitamin D

Toxic Manifestations		Observed Effects			
Symptoms	Hypercalcemia, Mg. per 100 Cc.	Subjective Changes	Objective Changes	Weight Changes	End Results and Comments
Nausea, epigastric discomfort	11.1 on 2 occasions	Joint symptoms not affected; fewer constitutional symptoms; stronger	None	Gained 14 pounds	Gained weight, some subjective general improvement; decreased sedimentation rate; no objective change
Nausea, vomiting, anorexia, diarrhea, headache	12.5 on 1 occasion—12 days after first appearance of toxic symptoms, 6 days after discontinuing vitamin D	None	None	Lost 4 pounds	No changes observed; sedimentation rate of 0.56 obtained at time of hypercalcemia; final sedimentation rate unaltered
None	12.0 on 1 occasion	None	None	Unchanged	No change in weight, sedimentation rate, or clinical condition
None	Not encountered	Less pain; slight general improvement	No change; one new joint (temporomandibular) became involved during therapy	Unchanged	Subjective improvement; one joint became involved for the first time during period of treatment; no change in weight or sedimentation rate
Nausea, vomiting, anorexia, epigastric pain	11.0 to 16.0, 12 weeks' duration	Less pain; slight general improvement	Slight reduction in joint swelling; slight increase in joint motion	Unchanged	Slight subjective and objective improvement; sedimentation rate not significantly altered; no weight change
"Indigestion"	11.8 on 1 occasion; became normal without altering dosage	Much stronger, less fatigue, less pain	More alert in appearance and activity; joint showed freer motion	Gained 6 pounds	Moderate subjective improvement; slight improvement objectively, mainly in general nutritive state; motions of joints freer, but soft tissue swelling and mobility unaltered; slight weight gain; sedimentation rate lowered
None	11.3 to 11.4, 3 weeks' duration	None	None	Unchanged	Far advanced case with joint deformities; some joints of recent involvement; no change of any kind noted while under treatment; patient himself discontinued treatment because of disappointing results
Nausea, epigastric distress, anorexia, diarrhea	11.6 and 12.5 on 2 isolated occasions; 11.4 to 12.9, 3 months' duration; 12.0 to 11.1, 2 months' duration	None	None	Unchanged	Had exacerbation and remission while taking vitamin D; condition unchanged; sedimentation rate rose
Nausea, vomiting, heart burn, anorexia	12.8 to 12.8, 4 weeks; still 11.0, 15 days later 12.0, 1 additional occasion	Slight improvement in general strength; less joint pain	Slight reduction of joint swelling	Unchanged	Slight subjective and objective improvement; no change in weight or sedimentation rate; lowered sedimentation rate during therapy observed at time of hypercalcemia
Nausea, anorexia, frequency of urination, drowsiness	12.2 and 16.6 on 2 occasions	Improved at beginning (general strength, less pain); relapsed during course of treatment	None	Unchanged	Subjective improvement with onset of therapy, followed by relapse; no other type of improvement noted
Headache	11.7 on 1 occasion, dropped to normal without altering dosage	Improved at beginning; later relapsed	None	Unchanged	Large psychic element; subjectively improved at first, later discontinued therapy because of relapse; sedimentation rate decreased despite failure to improve
None	Not encountered	Marked improvement—less pain and stiffness; felt stronger and noted less fatigue	Marked improvement; reduction of swelling, disappearance of effusions, better joint motion	Gained 21 pounds	Marked improvement subjectively and objectively, with fall in sedimentation rate; gained 21 pounds; improvement lasted only a few weeks after therapy was discontinued
Nausea, epigastric discomfort, anorexia	11.9 and 12.0 on 2 occasions	Same improvement as experienced during first course but less marked and slower	Same as first course, but not so marked	Unchanged	During second period of therapy, subjective and objective improvement and drop in sedimentation rate noted; no weight change; improvement very slow
None	11.1 to 12.6, 4 weeks	Felt stronger and less pain at first; later relapsed to original state	None	Gained 10 pounds	Gained weight but showed no subjective or objective change at end of therapeutic trial; sedimentation rate higher at end
Nausea, epigastric distress	14.2 to 11.5, 12 weeks; 11.2 to 12.4, 13 weeks	Slight improvement in general strength	None	Unchanged	Except for slight subjective improvement, patient showed no change in condition; weight and sedimentation rate not altered
Anorexia	11.9 to 11.3, 2 weeks	None	None	Unchanged	Typical adult type of rheumatoid arthritis in a child; no change in clinical condition, weight or sedimentation rate while receiving therapy
None	11.2 to 11.9, 4 weeks	None	None	Unchanged	No change of any kind observed
Toxic symptoms persisted until the dose was reduced to 60,000 units	11.3 on 1 occasion	Moderate remissions and relapses while on a constant dose	Joint signs fluctuated markedly during treatment	Unchanged	Had moderate remissions and relapses while under treatment; final condition unchanged either subjectively or objectively; sedimentation rate fluctuated during course but final reading lower than pretreatment figure; no weight change
Marked anorexia, nausea and vomiting	11.6 to 12.5, 4 months	Slight subjective improvement	Swelling of wrists and fingers varied greatly during treatment	Lost 8 pounds	Slight subjective and objective improvement; general physical status and sedimentation rate unchanged

‖ Private patient of one of the authors (W. B.).
‡ Doses of 200,000 U. S. P. units and over were reached only with a preparation of vitamin D in sesame oil.
¶ Includes period of four months when drug was taken irregularly at the rate of about 30,000 to 40,000 U.S.P. units daily.
† In this column a indicates first course of treatment and b second course of treatment.

four to eight weeks in order to establish how often hypercalcemia resulted and whether or not suspected toxic symptoms occurred at the same time. Vitamin D[16] in the form of Drisdol (1 drop = 250 U. S. P. units) was administered for a short time to the first five patients in the series. These and the remaining patients subsequently received a more concentrated preparation, crystalline vitamin D in propylene glycol (1 drop = 1,000 U. S. P. units) or in sesame oil (1 drop = 25,000 U. S. P. units). One third or one fourth of the total daily dose was administered with each meal, and the fourth (when given) was taken at bedtime. All preparations were administered in milk, because Lewis[17] has shown that the antirachitic vitamin dissolved in propylene glycol is better utilized in the medium of milk than in the medium of corn oil. Throughout the period of study all patients were kept on a constant therapeutic regimen consisting of a high vitamin, high caloric diet (unless overweight), regular rest periods, daily physical therapeutic measures, vitamin B in the form of yeast and a constant ration of acetylsalicylic acid. No new therapy was added during the period of observation.

RESULTS

Subjective Improvement.—As can be seen from tables 2 and 3, if one were to judge solely on the basis of subjective improvement one might conclude that a good percentage of the patients with rheumatoid arthritis were benefited by vitamin D therapy. Subjective improvement, consisting of increased strength and feeling of well being, less of the myasthenia gravis-like fatigability and a reduction of pain and stiffness was reported by twelve of the eighteen patients. In four instances such improvement was short lived, being experienced only during the first few weeks of therapy. In the other eight cases such improvement was present throughout the period of treatment. In one instance it was marked, in another moderate, and in six slight. Such improvement was not maintained more than a few weeks following the discontinuance of vitamin D therapy.

Objective Improvement.—When evidence of improvement is judged on the basis of objective changes, one notes from tables 2 and 4 that only five of the eighteen patients experienced benefit from vitamin D therapy. These five patients had also experienced subjective improvement. In four the objective improvement was slight; in one it was marked. From table 2 it will be seen that the patient (286) in whom improvement was marked received large doses of vitamin D on two different occasions and each time experienced marked objective as well as subjective improvement. The improvement observed each time consisted of marked reduction of soft tissue swelling, disappearance or marked reduction of effusions of the knee joints and an increase in motion of the joints. In the other three cases the improvement was less marked and consisted of slight reduction of the soft tissue swelling and increase in motion of the joints. In one case (66) involvement of the new joints occurred during therapy. Two patients (F. D. and C. M.) experienced marked remissions and exacerbations of signs and symptoms in the joints during the period of treatment, yet the dosage of vitamin D was kept constant throughout this time.

Weight Gain.—Improvement as measured by an appreciable weight gain (5 or more pounds) was observed in five patients (32, 120, 286, 328 and F. D.). Two of these patients (120 and 286) had noted subjective and objective improvement. Such beneficial effects were most marked in patient 286, who gained a total of 21 pounds (9.5 Kg.). Patients 32 and 328 had noted only subjective improvement, whereas Mrs. F. D. had exacerbations and remissions of both subjective and objective change.

Effect on the Sedimentation Rate.—From experience to date, the corrected erythrocyte sedimentation rate[18] has proved to be the most reliable laboratory test for determining the activity of rheumatoid arthritis.[18] This one objective laboratory test was performed at regular intervals before, during and after vitamin D therapy in order to determine whether the encountered variations in the sedimentation rate paralleled the observed clinical course of the disease.

In order to be consistent in judging when a decrease in the corrected sedimentation rate was significant, it was found necessary to follow some arbitrary rule.

TABLE 3.—*Subjective Improvement*

Marked improvement during entire period of therapy	1
Moderate improvement during entire period of therapy	1
Slight improvement during entire period of therapy	6
Improved only at beginning of therapy	4
No improvement at any time	6

TABLE 4.—*Objective Improvement*

Marked improvement	1
Slight improvement	4
No improvement	13

The one described here was finally adopted. In cases in which the sedimentation rate had varied between 0.5 and 1 mm. per minute a decreased rate was not considered significant unless it had fallen 0.15 mm. or more below the previously recorded rate. When the sedimentation rate had varied between 1 and 1.5 mm. per minute, a decrease of 0.2 mm. or more was considered significant. In cases in which the rate had been 1.5 mm. or more per minute a reduction was not considered significant unless it exceeded 0.3 mm. per minute.

In order to conserve space and yet give the reader some idea as to the changes observed in the curves of the sedimentation rate of each patient during the pretreatment, treatment and follow-up periods, the maximal-minimal variations for each patient are presented in table 2. Detailed curves of the sedimentation rate of four patients are presented in the accompanying chart. From the chart and table 2 one notes that alterations in the curves of the sedimentation rate were observed in only seven of the eighteen patients, but in only five was it significant. In cases 120 and 286 (as seen in the chart and in table 2) subjective and objective improvement took place at the same time. In case 286 a reduction in the sedimentation rate and clinical improvement were noted each time vitamin D was administered. In

16. The Winthrop Chemical Company placed the vitamin D preparations at our disposal for this study.

17. Lewis, J. M.: Clinical Experience with Crystalline Vitamin D: The Influence of the Menstruum on the Effectiveness of the Antirachitic Factor, J. Pediat. 6: 343 (March) 1935.

18. Short, C. L.; Dienes, Louis, and Bauer, Walter: Rheumatoid Arthritis: A Comparative Evaluation of the Commonly Employed Diagnostic Tests, J. A. M. A. 108: 2087 (June 19) 1937.

two other patients only subjective improvement was noted. The fifth patient, showing a lowered sedimentation rate, experienced no clinical improvement. Eleven of the remaining thirteen patients showed no significant alteration in the curve of the sedimentation rate. The sedimentation rates of the other two patients were increased, although both patients had considered themselves subjectively improved during the first weeks of therapy.

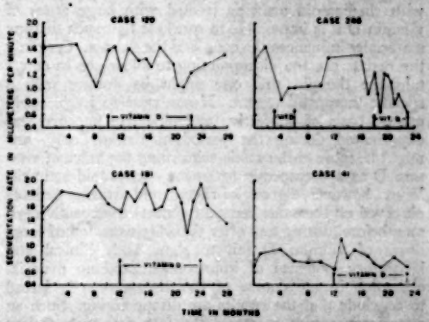
The observed changes in the sedimentation rates are difficult to interpret. That they cannot be of great significance is attested by the fact that both subjective and objective improvement was observed in only two of the eighteen cases studied. In fourteen cases the degree of variation encountered was as great in the pretreatment and follow-up periods as it was in the therapy period. In the chart, the variations in the curves of the sedimentation rates of the two patients who improved subjectively and objectively are compared with those of two patients who did not. These illustrated curves of the sedimentation rate serve to stress the fact that judging clinical improvement is extremely difficult even when a purely objective laboratory test is employed as the measuring stick. For instance, in case 120 the lowest sedimentation rate observed in the period of therapy was no lower than had been observed in the pretreatment period. One further observes that the sedimentation rate had begun to rise before vitamin D was discontinued. Although the changes observed in cases 120 and 286 may very well have been the result of vitamin D therapy, there is no denying the fact that they may represent, at least in part, the natural fluctuations that one frequently observes in patients receiving no specific therapy. Certainly one is not justified in drawing conclusions concerning improvement based on the sedimentation rate unless a significant sustained lowering takes place with some regularity in most patients during the period of therapy. Not having observed such an effect with any regularity in the eighteen cases studied, one is forced to conclude that vitamin D does not have any beneficial effect on the clinical course of rheumatoid arthritis as judged by the curve of the sedimentation rate. It was interesting to note that the greatest reductions in sedimentation rates frequently occurred at the time of the hypercalcemia. Such drops in the sedimentation rate were usually transient even though the hypercalcemia persisted. Variations of this type were encountered as often in those patients who did not experience clinical improvement as in those who did. This type of change in the sedimentation rate is probably directly related to the hypercalcemia and serves as further evidence that the variations in the sedimentation rates of erythrocytes cannot be ascribed to any one factor.[19]

Final Result and Duration of Improvement.—The improvement noted always took place slowly. The best clinical and laboratory results were observed in case 286. These were observed each time vitamin D was administered but were never sudden or dramatic. The patient was hospitalized throughout each course of vitamin D therapy. The beneficial results in this case as in the others were short lived. During the follow-up study it was noted that the arthritis gradually became as severe as it had been in the pretreatment period. Such changes were obvious in a few weeks. The other three patients who had experienced subjective and objective improvement fared no better. In the fourteen cases not materially influenced by vitamin D the arthritis ran the same pretreatment course during and after the period of administration of vitamin D. Results such as these serve to emphasize the fact that follow-up studies are needed.

19. Ropes, Marion W.; Rossmeisl, Elsie, and Bauer, Walter: The Relationship Between the Erythrocyte Sedimentation Rate and the Plasma Proteins, J. Clin. Investigation 17: 530 (July) 1938.

HYPERCALCEMIA AND VITAMIN D TOXICITY

The pretreatment calcium, phosphorus and phosphatase values of all eighteen patients were normal, indicating as have previous studies that the calcium and phosphorus metabolism of rheumatoid arthritic patients as judged by the blood examination is normal. In sixteen of the eighteen patients hypercalcemia developed at some time during the period of vitamin D therapy. From table 2 it will be noted that hypercalcemia was noted only on one or two occasions in nine of the eighteen patients. In five instances (32, 41, 120, 127 and 229) there were no significant associated symptoms of toxicity, and the serum calcium returned to normal without alteration of the dose of vitamin D.



These curves of sedimentation rates illustrate how difficult it is to interpret clinical improvement even though it is based on an objective laboratory test. Patients 120 and 286 experienced both subjective and objective improvement while receiving large doses of vitamin D, whereas patients 181 and 41 did not.

In cases 40, 221, 286 and F. D. either vitamin D was discontinued or the dose was reduced because of the degree of hypercalcemia or the severity of the toxic symptoms. In the other seven cases fasting serum calcium values varying from 11.2 to 16 mg. per hundred cubic centimeters persisted for weeks (from three to twenty-five) unless the dose of vitamin D was reduced or the drug discontinued. In most instances such values for hypercalcemia were not encountered until the dose was maintained between 160,000 and 200,000 U. S. P. units daily. However, a hypercalcemia of from 11.2 to 14.2 mg. per hundred cubic centimeters was observed in patient 335 for a period of twenty-five weeks, during which time the daily dose of vitamin D never exceeded 60,000 U. S. P. units. We were unable to exceed a dose of 200,000 U. S. P. units daily of the crystalline vitamin D in propylene glycol administered in milk without encountering toxic symptoms. Although the patients did tolerate larger doses of the crystalline vitamin D-sesame oil preparation, in no instance could we exceed a dose of 300,000 U. S. P. units daily without encountering serious toxic symptoms or hypercalcemia.

The toxic symptoms observed were similar to those previously described,[20] consisting of anorexia, nausea, vomiting, epigastric distress or pain, diarrhea, headache, drowsiness, polyuria, polydipsia and nocturia. In some instances these symptoms were sufficiently marked to be alarming. Both the toxic symptoms and hypercalcemia often persisted for several weeks following discontinuance of the vitamin D therapy. An increased fasting serum phosphorus was observed on only two occasions. In these two instances values of 5.1 and 5.5 mg. per hundred cubic centimeters were observed with serum calcium values of 11.3 and 16.6 mg. In only one case did the serum phosphatase rise above a value of 5 Bodansky units. In this single instance a value of 6.5 units was observed with a normal serum calcium and phosphorus (10.2 and 3.4 mg. per hundred cubic centimeters respectively). As can be seen from table 2, the degree of hypercalcemia, its duration and the severity of the associated toxic symptoms were in no way related to the observed subjective and objective changes.

COMMENT

From the results observed in this series of patients with rheumatoid arthritis treated with large doses of vitamin D it is impossible to conclude that such therapy materially influences the course of the disease. Certainly the results are too disappointing to allow one to entertain the thought that one might be dealing with a specific therapeutic agent. If one were to judge solely on the basis of subjective and objective improvement experienced during the period of therapy only, one might be more enthusiastic concerning the value of vitamin D as a therapeutic agent for rheumatoid arthritis. When, however, a group of rheumatoid arthritic patients observed on the same constant general therapeutic regimen before, during and after the administration of large doses of vitamin D fail to show both clinical and laboratory evidence of improvement and no material alteration in the course of the disease, one is forced to conclude that the results are disappointing. Such an experience serves to stress the fact that each patient should serve as his own control and that adequate follow-up periods are necessary to judge the therapeutic results when one is dealing with a chronic disease such as rheumatoid arthritis. One might contend that beneficial effects are observed only while vitamin D is being administered. The data herein presented nullify such a contention. It might be argued that large doses of vitamin D are a useful addition to the therapeutic armamentarium employed in treating this disease. From our results we would conclude that the same general beneficial effects are experienced as often when vitamin D is administered in the usual therapeutic doses and that such dosages do not entail the risks attendant on hypercalcemia.

One might argue that failure to administer the same large doses of vitamin D employed by others is adequate reason for our not having obtained the same beneficial results previously reported. Evidence in favor of such an argument is readily obtained from tables 1 and 2, which show that only three patients in our series ever received a dose exceeding 200,000 U. S. P. units daily, whereas other workers have administered as much as 500,000 U. S. P. units or more daily. Because severe toxic symptoms or hypercalcemia were encountered in all but three patients whenever the daily dose exceeded 200,000 U. S. P. units, we did not feel justified in employing larger doses. As can be seen from table 2, hypercalcemia was encountered more frequently than were toxic symptoms. Of these two complications of vitamin D therapy the hypercalcemia is the more serious, because if it is allowed to persist extensive calcium deposits and other pathologic changes may ensue.[21]

Other workers[22] have reported that hypercalcemia and toxic symptoms are rarely encountered when large doses of vitamin D are administered, yet in our small series of patients receiving smaller doses hypercalcemia was observed in sixteen of the eighteen patients, and in seven cases it persisted for weeks unless the dose of vitamin D was reduced or the drug was discontinued. There appears to be only one possible explanation for such discrepancies, namely that the vitamin D preparation administered to the patients in this series was always given in milk. The medium of milk, according to the work of Lewis,[17] allows for better utilization of a solution of crystalline vitamin D in propylene glycol than does the medium of corn oil (the medium employed by Reed and others). Lewis's results indicate that the antirachitic potency of such crystalline vitamin D preparations is increased tenfold when administered in milk. Whether a similar increased vitamin D potency resulted in our studies in consequence of the administration of the vitamin in milk we are unable to say with certainty. The high percentage of patients in whom hypercalcemia and toxic symptoms developed would suggest that such an increase in potency had occurred. If it did, then we were administering larger doses than the dosage in table 2 indicates. If this is true, the argument that failure to obtain better clinical results in this series was due to the employment of smaller doses no longer holds.

In order to be certain that the medium of propylene glycol might not be responsible for the high percentage of patients exhibiting toxic symptoms, this possibility was investigated. Propylene glycol was administered in milk to five patients in doses the same as or larger than they had received when taking the propylene glycol containing vitamin D. In no instance were any symptoms experienced; therefore this possibility is untenable.

Some workers[23] have contended that the simultaneous administration of yeast will aid greatly in controlling or preventing the toxic symptoms associated with large doses of vitamin D. Such was not our experience. As previously stated, all our patients received yeast throughout the period of observation, yet in a large percentage toxic symptoms developed.

No increased calcification or intra-articular changes were demonstrable roentgenographically in this series or others[24] following the administration of vitamin D. This is not surprising. We know that we are not dealing with a calcium and phosphorus deficiency disease and that the ability of articular cartilage to repair itself is at best very limited.[25] Therefore we are skeptical of statements[26] to the effect that filling in of

20. Rappaport, Reed, Hathaway and Struck.[2] Vrtiak and Lang.[4] Steck, Deutsch, Reed and Struck.[3] Hoech, Bauer, Christ, Hall, Holbrook, Key and Slocumb.[5]

21. Rappaport, Reed, Hathaway and Struck.[2] Steck, Deutsch, Reed and Struck.[3]

22. Dreyer and Reed.[1] Livingston.[6] Vrtiak and Lang.[4]

23. Reed.[3] Livingston.[6]

24. Vrtiak and Lang.[4]

25. Bennett, G. A., and Bauer, Walter: A Study of the Repair of Articular Cartilage and the Reaction of Normal Joints of Adult Dogs to Surgically Created Defects of Articular Cartilage, "Joint Mice" and Patellar Displacement, Am. J. Path. 8:499 (Sept.) 1932. Bennett, G. A., and Bauer, Walter: Further Studies Concerning the Repair of Articular Cartilage in Dog Joints, J. Bone & Joint Surg. 17:141 (Jan.) 1935.

26. Farley.[7] Steck.[8]

rarefied areas and reconstruction of articular cartilage in cases of rheumatoid arthritis have been observed in consequence of large doses of vitamin D.

Most therapeutic discoveries are soon acclaimed by others and the original reports of the discoverers substantiated by further and more detailed reports. As in the case of many other previously discovered antirheumatic remedies, such acclaim and substantiations have not appeared. Until they do, one is hardly justified in prescribing an expensive therapeutic agent capable of producing toxic symptoms and serious pathologic changes. For these reasons the Council on Pharmacy and Chemistry of the American Medical Association has been unwilling to include in New and Nonofficial Remedies Ertron and other high potency viosterol preparations as being specific in the treatment of arthritis.[27] If the beneficial results from vitamin D are to be ascribed to some impurity contained in the preparations employed, it had best be isolated and tested separately.

SUMMARY AND CONCLUSIONS

1. The effect of massive doses of vitamin D has been observed on eighteen patients with rheumatoid arthritis.

2. Observations prior to treatment showed that all the patients were in a stationary or slowly progressive state.

3. Subjective improvement lasting throughout the period of therapy was observed in eight cases. In only three instances was this accompanied by objective improvement and in only one was it marked. Such improvement was short lived when therapy was discontinued.

4. Only five patients showed a significant alteration in the curves of their sedimentation rate, and only two of these were improved subjectively and objectively.

5. Five patients gained weight during treatment.

6. Our results indicate that the administration of massive doses of vitamin D in rheumatoid arthritis is of little or no value in altering the course of the disease. The general effects of the larger doses do not appear significantly different from those observed with the usual therapeutic doses and do not justify the expense and dangers involved.

27. The Status of Certain Questions Concerning Vitamins, Reports of the Council on Pharmacy and Chemistry, J. A. M. A. **106**: 1732 (May 16) 1936; Condol and Ertron Not Acceptable for N. N. R., ibid. **108**: 132 (July 10) 1937.

Experiment and Then Think.—By 1850 Bernard's fame as an exponent of the experimental method in medicine began to be spread throughout Europe and overseas to the United States of America. At this time young physicians in America, as soon as they had taken their medical degrees, set out, if they were able, on the grand tour, and their principal objective was France rather than Germany. It is said that not only did they visit hospitals, their primary interest, but nearly all of them attended some of Bernard's lectures at the Collège de France, and a few engaged in experimentation under his direction. One of the best known American doctors of the nineteenth century, Weir Mitchell of Philadelphia, spent the year 1850-1851 in Paris, and, although he attended courses designed for surgical training, he wrote home that he liked Bernard's lectures in physiology and Robin's in microscopy much better. Bernard's pedagogical attitude is well illustrated in a conversation with Weir Mitchell. The latter had said that he thought so and so must be the case. "Why think," replied Bernard, "When you can experiment? Exhaust experiment and then think."—Olmsted, J. M. D.: Claude Bernard, Physiologist, New York, Harper & Bros., 1938.

SULFANILAMIDE IN THE TREATMENT OF BRAIN ABSCESS AND PREVENTION OF MENINGITIS

PAUL C. BUCY, M.D.
CHICAGO

The cure of a brain abscess and prevention of an almost certain hemolytic streptococcus meningitis by the administration of sulfanilamide has not been previously reported. Rowe[1] in a recent article describes two cases of brain abscess in which sulfanilamide constituted part of the therapy. The first patient had a pneumococcic (type V) abscess of the cerebellum which was treated also by surgical drainage and the administration of 220,000 units of appropriate pneumococcus antiserum. The second patient had a cerebellar abscess, culture of which revealed Friedländer's bacillus. The abscess was also treated by surgical drainage. As many instances of abscesses similar to these cured by drainage alone are known, as pneumococcus antiserum was used in case 1 and as sulfanilamide has not been shown to be effective against Friedländer's bacillus, as Rowe notes, it is impossible to credit sulfanilamide with the excellent result obtained in Rowe's cases.

In the case reported here the presence of a streptococcic cerebellar abscess was confirmed by culture of the pus obtained by aspiration, but the abscess was not drained. Furthermore the surface of the cerebellum, washed by cerebrospinal fluid and directly connected with the ventricular system and subarachnoid space, was contaminated with pus swarming with hemolytic streptococci. Certainly in the ordinary course of events a meningitis would have developed. Under sulfanilamide therapy there was no recurrence of symptoms attributable to the abscess, and no symptoms of meningitis ever appeared.

REPORT OF CASE

History.—F. S., a girl aged 4 years, referred to the University of Chicago Clinics by Dr. Joseph Brennemann of the Children's Memorial Hospital, was perfectly well until March 7, 1938, when she complained of a pain in her right ear. Her family physician was called. He prescribed some drops for instillation in the external auditory canal. The following day she had apparently completely recovered and continued to be well until March 29, when she suddenly complained of severe pain in her head. She vomited twice that evening. The pain and vomiting continued and she rapidly grew weak and was unable to walk. April 2 she was admitted to the Children's Memorial Hospital. There she was examined by a competent otologist, who could find no evidence of any disease in the ears. A lumbar puncture was made and the spinal fluid is reported to have contained 60 lymphocytes per cubic millimeter and 60 mg. of dextrose per hundred cubic centimeters. She was uncooperative and cried almost continuously. The head was retracted and drawn to the left so that the left ear almost touched the left shoulder. There was bilateral papilledema and deviation of the eyes to the left. All voluntary movements were ataxic, particularly those of the left extremities. A diagnosis of an expanding lesion in the left cerebellar hemisphere was made.

Examination.—She was transferred to the University of Chicago Clinics April 3 at 4 p. m. On admission here she was stuporous and cried out only when moved. The head was retracted and there was marked suboccipital tenderness. Definite early choking of the optic disks was present. The pupils were dilated and reacted poorly to light. The eyes were deviated to the left. The cranial nerves were otherwise normal.

From the Division of Neurology and Neurosurgery, University of Chicago.

1. Rowe, S. N.: The Use of Sulfanilamide in the Treatment of Brain Abscess, Ann. Surg. **107**: 620-626 (April) 1938.

The tendon reflexes were active throughout, though somewhat more marked on the right side. There was an unsustained ankle clonus on the left and the Babinski sign was present bilaterally. The response to pin prick was equal throughout. The right arm was moved very infrequently, whereas the left arm and the legs were moved freely and often. There was a definite hypotonia in the left extremities and some spasticity on the right. The temperature was 37.2 C. (99 F.), the pulse rate 120 and the respiratory rate 22 per minute. It was obvious that she was suffering from severely increased intracranial pressure. Accordingly it was decided to puncture the lateral ventricles and leave a T-shaped needle in places for continuous drainage. This was done at 10 p. m. on the day of admission by Dr. R. B. Cloward. The ventricular fluid was under markedly increased pressure, and drainage was profuse. Immediately after this procedure she became alert, recognized her father and talked readily and coherently. Subsequently examination revealed persistence of the papilledema and deviation of the eyes to the left with inability to move her eyes to the right beyond the midline. The tendon reflexes were active and equal. The Babinski sign was present bilaterally. She could move all four extremities and all were ataxic, though this condition was more marked on the right side, but otherwise the signs did not change. Roentgenograms of the skull revealed no separation of the cranial sutures. On admission the white

Course Under Sulfanilamide Therapy

Date	Red Blood Cells	Hemoglobin (Sahli), per Cent	White Blood Cells	Blood Sulfanilamide, Mg. %	Sulfanilamide per 24 Hours, Gm.
4/ 6	4.46	69	32,600	.....	...
4/ 7	Aspiration of abscess				
	3.96	62	31,800	.....	3.7
4/ 8	3.63	63	32,100	13.15	3.0
4/ 9	3.62	53	23,400	15.86	2.7
4/10	2.44	44	25,000	.....	1.8
4/11	Transfusion of 300 cc. of citrated blood				
	3.11	60	18,550	7.10	1.8
4/12	3.65	62	15,500	.....	1.8
4/13	3.86	65	11,800	9.5	1.8
4/14 to 4/17	....	..	.....	.....	1.8
4/16	3.94	69	14,150	6.06	1.5
4/19	3.76	77	14,650	.....	1.8
4/20 to 4/26	....	..	.....	.....	1.2
4/27	4.32	71	13,850	4.00	1.2
4/28 to 5/5	....	..	.....	.....	1.2
5/ 6	4.85	80	.....	2.80	1.2
5/7 to 5/10	....	..	.....	.....	1.2
5/11	....	..	.....	2.60	1.2
	Sulfanilamide discontinued				

blood cell count was 32,600 with 70 per cent polymorphonuclear leukocytes. The urine was normal and the Wassermann and Kahn reactions on the blood were negative.

Diagnosis.—It was felt that she had an expanding lesion of the left cerebellar hemisphere. The rapid progression and the reported pleocytosis in the spinal fluid pointed toward an abscess, but the absence of any demonstrable infection in the ear or elsewhere seemed against that diagnosis.

Operation.—April 7 the suboccipital region was explored. At first only the left lower limb of the usual curved suboccipital incision was made. A trephine opening was made in the bone and this opening enlarged. The dura was incised, the left cerebellar hemisphere, which was under considerable tension, being exposed. The subdural space was packed off with gauze soaked in a weak solution of iodine and the hemisphere explored with a needle. No abscess was found but at a depth of 2 cm. the needle encountered considerable resistance, which was interpreted as indicating the presence of a tumor. Accordingly the suboccipital incision was completed and the entire cerebellum was exposed. The right hemisphere was somewhat larger and softer than the left. A needle inserted into the medial part of this hemisphere again encountered resistance. The needle was then inserted laterally and encountered an abscess. Suction was immediately applied to the end of the needle and a large quantity of pus was removed. In spite of our efforts to prevent soiling of the field a drop of pus escaped about the needle onto the surface of the cerebellum. Smears of the pus revealed many small chains of cocci; subsequent culture yielded a heavy growth of hemolytic streptococci.

All communications between the surface of the cerebellum, the cisterna magna and the fourth ventricle and spinal subarachnoid space were wide open. Hemolytic streptococcus meningitis therefore seemed unavoidable. Soft rubber drains were inserted between the surface of the cerebellum and the muscles of the neck on both sides and the wound was closed.

Postoperative Course.—Sulfanilamide therapy was begun at once.[2] The patient was given 1.6 Gm. in 200 cc. of physiologic solution of sodium chloride by hypodermoclysis immediately and 0.3 Gm. by mouth as soon as she could swallow. The blood counts, sulfanilamide determinations of the blood and daily dosage of sulfanilamide are recorded in the accompanying table. A total of 49.9 Gm. of sulfanilamide was given between April 7 and May 11, i. e. in thirty-five days. The day following operation, April 8, the temperature rose to 39 C. (102 F.) but by April 10 it was back to 37 C. (98.6 F.) and remained between 37 and 38 C. (100.4 F.) thereafter.

The patient's condition immediately after the operation was good and continued so. There was profuse drainage of cerebrospinal fluid, and this was encouraged by keeping the patient flat in bed and forcing fluids as much as possible. Within two days (April 9) the amount of drainage was greatly reduced. April 10 the drain was removed from the left side. By April 12 all discharge of cerebrospinal fluid had ceased and the drain was removed from the right side. The abscess itself was never drained, these drains having been lying between the surface of the cerebellum and the muscles of the neck.

For two days following the aspiration of the abscess the inability to move the eyes to the right was still present, but this disturbance then disappeared. For a day or two the ataxia of the right arm persisted and then it too disappeared. By April 16 the neurologic examination was essentially negative.

On the sixth postoperative day (April 13) the patient was able to sit up in bed and feed herself. Eleven days after the operation she was able to be up in a wheel chair and four days later she was walking with assistance. She was soon running and playing about the corridors and playroom, seemed perfectly well and could have been discharged from the hospital any time after the fifteenth postoperative day. She was kept in the hospital, however, for observation and the administration of sulfanilamide as indicated in the table. She was discharged from the hospital May 15, thirty-eight days after the operation. Since her discharge she has been followed in the outpatient department of this and of the Children's Memorial Hospital. When last seen, August 30, she was perfectly well.

COMMENT

Contralateral Deviation of the Eyes.—One of the clinical manifestations in this case particularly excited our attention; to wit, conjugate deviation of the eyes to the side away from the abscess, with an inability to bring the eyes back beyond the midline. On reviewing our previous cases of cerebellar abscess I found one other case (B. S.) in which an abscess of the vermis and right cerebellar hemisphere was associated with a conjugate deviation of the eyes to the left. Rowe[1] also presents two cases of abscess in the left cerebellar hemisphere with deviation of the eyes to the right. This sign is certainly not frequent in cases of cerebellar tumor, although it is not uncommon with tumors of the pons and may prove of value not only in localizing a cerebellar abscess but also in differentiating abscess from cerebellar tumor.

Sulfanilamide Therapy.—The efficacy of sulfanilamide in the treatment of hemolytic streptococcus infections is too well established to merit further discussion. That the sulfanilamide was effective in this case in preventing the development of a meningitis can scarcely be doubted. The cerebrospinal fluid space was contaminated with pus which on culture gave a heavy growth of these organisms. That they were highly virulent is clear from the pathologic changes already produced and the fact that the illness from the first

2. Dr. Margaret Tingle of the Department of Pediatrics assisted in the administration of the sulfanilamide and repeatedly determined the concentration of the drug in the blood.

manifestation, ear ache, was of less than one month's duration and only of six days' duration from the onset of symptoms of the abscess itself until admission to this hospital.

The effect of the sulfanilamide on the abscess itself is perhaps not quite so clear. A considerable part, although undoubtedly not all, of the pus within the abscess was removed by aspiration on the one occasion on which the abscess was punctured, and furthermore a suboccipital decompression was made. In the experience at this clinic [2] no large abscess infected with hemolytic streptococci has ever been cured by a single aspiration. Kahn [4] has had a similar experience. Dandy,[5] on the other hand, intimates that cases of brain abscess (infecting organism not stated) have in his experience been cured by a single tapping, although he cites no particular instance. Grant and Groff [6] have recently reported the apparent cure of a cerebellar abscess by a single tapping. They give no information, however, as to what the infecting organism was or whether the abscess was sterile. In spite of the uncertainty introduced by the experiences of Dandy and of Grant and Groff, it is very likely that the sulfanilamide was an important factor in preventing refilling of the abscess and recurrence of the symptoms in this case, as practically all neurosurgeons would admit that decompression and a single aspiration would but rarely, if ever, result in the cure of a hemolytic streptococcus cerebellar abscess.

Implications for Future Treatment.—In a recent publication [2] the usual method of handling abscesses of the brain in this clinic has been presented. The procedure is briefly as follows: Drainage of the abscess is carried out in two stages. At the first operation a defect measuring 3 or 4 cm. in diameter is made in the skull overlying the abscess. The dura is incised. The subdural space about the opening is packed with gauze soaked in a weak solution of iodine. If the degree of increased intracranial tension is such as to demand immediate relief, a needle is inserted and pus is allowed to escape. Nothing further is done at this time. Two days later the pack is withdrawn from the subdural space. Six days after the first operation the wound is reopened, the abscess exposed, opened widely, evacuated and drained.

In view of the experience recorded here it is proposed in the future to begin the administration of sulfanilamide immediately after the first stage. A culture of the pus obtained will, of course, be taken and if the organism is a streptococcus or pneumococcus the sulfanilamide therapy will be continued. If the organism is a staphylococcus or some other organism not favorably influenced by this drug, sulfanilamide will be discontinued and the abscess drained as usual. If under sulfanilamide therapy the abscess does not refill and the patient continues to recover, no further surgical treatment will be attempted. If the abscess does refill, the drainage of the abscess can be carried out at a second operation, as has been done in the past. It is hoped that by this procedure a radical attack on the abscess with inherent damage to the surrounding brain tissue and dangers of extension of the infection will be avoided in some cases of abscess infected with hemolytic streptococci and pneumococci. Attention should again be called to the possible toxic effect of sulfanilamide on the cells of the blood and therefore of the necessity of following the blood picture closely and of giving blood transfusions or of discontinuing the drug, as may be indicated.

2. Beer, P. C.: The Treatment of Brain Abscesses, Ann. Surg., to be published.
4. Kahn, E. A.: The Treatment of Encapsulated Brain Abscess (discussion), J. A. M. A. 108:87-90 (Jan. 9) 1937.
5. Dandy, W. E.: The Brain, in Lewis, Dean: Practice of Surgery, Hagerstown, Md., W. F. Prior & Co., 1932, vol. 12.
6. Grant, F. C., and Groff, R. A.: The Surgical Treatment of Brain Abscess, Pennsylvania M. J. 41:397 (April) 1938.

SUMMARY

Owing to an error in diagnosis a right cerebellar abscess was exposed with a bilateral suboccipital craniectomy. The contents of the abscess were aspirated and the surface of the cerebellum was contaminated with pus swarming with hemolytic streptococci, thus exposing the ventricular system and the subarachnoid space to this infection. The abscess was not drained. The administration of sulfanilamide was begun at once. The patient improved steadily. There was almost no febrile reaction and at no time did signs develop either of meningitis or of refilling of the abscess. The patient had almost completely recovered within two weeks. In the future it is proposed to treat all brain abscesses in a similar manner; that is, make a defect in the skull over the abscess, aspirate the pus and begin the administration of sulfanilamide. If this suffices, nothing further will be done; if not, the abscess will be opened, evacuated and drained as usual.

950 East Fifty-Ninth Street.

Clinical Notes, Suggestions and New Instruments

PERIPHERAL NEURITIS FOLLOWING SULFANILYL SULFANILAMIDE (DISULFANILAMIDE)

REPORT OF FOUR CASES

ROBERT S. WIGTON, M.D.
AND
SAMUEL HARRIS JOHNSON III, M.D.
PHILADELPHIA

Four cases presenting a characteristic picture of peripheral neuritis following the administration of sulfanilyl sulfanilamide (disulfanilamide) compounds were encountered at the Hospital of the University of Pennsylvania. Although these compounds are not at present proposed for general use in the United States, the cases are of interest. (It should be emphasized that this report concerns the use of sulfanilyl sulfanilamide and should not be construed to imply any similar toxicity of the widely used sulfanilamide compounds.)

REPORT OF CASES

CASE 1.—R., a white man aged 43, was admitted to the urologic service of the hospital Jan. 21, 1938. He had been under observation for a period of four years because of an established diagnosis of tuberculous cowperitis and cystitis. On reexamination the upper part of the urinary tract and the genital tract showed no evidence of tuberculous involvement. On cystoscopy, however, a generalized inflammatory reaction of the mucosa and an extensive pseudodiphtheritic membrane was observed. Culture of the urine was positive for diphtheroids and tubercle bacilli. In an attempt to free the bladder of the pseudodiphtheritic membrane the patient was given diodon, a brand of disulfanilamide, as a urinary antiseptic. For seven days (January 29 to February 5) he was given 45 grains (3 Gm.) a day; for eight succeeding days (February 5 to February 12) he was given 80 grains (5 Gm.) a day. The drug was discontinued because of increasing cyanosis and an intermittent febrile reaction. Subsequent routine culture of the urine was negative and cystoscopy revealed no membrane, although now the tuberculous ulcerations were apparent. There was no alteration of the blood picture.

Six days after the discontinuance of the diodon the patient complained of pain in the calves of both legs lasting two days.

From the Departments of Neurology and Urology of the Hospital of the University of Pennsylvania.

Difficulty in walking was then noted, and examination revealed marked weakness in flexion and extension of the ankles and toes. Some time later the patient complained of slight weakness in the grip of both hands. Examination revealed slight impairment in the power of the flexors of the fingers and wrists, and considerable weakness, particularly in adduction, of the thumbs.

Electrical reactions March 14, twenty-four days after the onset of the weakness in the legs, disclosed an incomplete reaction of degeneration in the adductor pollicis muscles on both sides. The only change in the other muscles involved was a decreased excitability to faradic current. The diagnosis was peripheral neuritis, presumably due to sulfanilyl sulfanilamide.

There was slight improvement in power over a period of several weeks, although at the last examination, May 21, thirteen weeks after the onset, there was definite weakness of the adductors of the thumbs and weakness of the extensors and flexors of the ankle, so that the patient was unable to rise on his toes or heels.

Case 2.—Z., a white man aged 22, was referred to the neurologic service of Dr. W. B. Cadwallader March 23, 1938. The patient contracted gonorrheal urethritis in August 1936 and was treated at that time with oral and subcutaneous medication for twelve weeks without subsidence of the discharge. He subsequently visited many clinics without relief.

From January to August 1937 he was treated intensively with local irrigations and prostatic massage. During this time repeated smears were positive for pus cells and gonococci. In August he received a course of sulfanilamide therapy starting with 60 grains (4 Gm.) a day. Smears continued to reveal positive results.

Feb. 14, 1938, uliron was given. He received nine tablets a day for one week and three tablets a day for the second week, the treatment ending February 28. One week later, March 7, pain and soreness of both calves were noted. Two days later this pain disappeared and at this time the patient noted loss of the power of flexion and extension of the ankles and toes. The gait was weak and staggering. He also noted weakness in the grip in both hands, and weakness in extension of the wrist. Most characteristic was marked weakness of adduction of the thumbs. There was no history of dietary deficiency or exposure to heavy metals.

Examination on admission revealed absent achilles tendon reflexes, increased sway when the eyes were closed, and steppage gait due to marked weakness of the flexors and extensors of the ankle. There was slight impairment of pain, temperature and vibratory sensation in the distal portions of all four extremities, weakness of the extensors and flexors of the wrists and fingers, marked weakness in the adductors of the thumbs, and slight wasting and loss of tone in the involved muscles.

Laboratory studies were negative. These included prostatic smears, spinal fluid studies, blood urea nitrogen, blood sugar, sedimentation rate, urinalyses and blood counts.

An attempt was made to determine any demonstrable effect of vigorous vitamin B_1 therapy. A controlled diet providing a minimal maintenance intake of vitamin B_1 was given from April 1 to April 24 inclusive. On April 7, 30 mg. of thiamin chloride (crystalline vitamin B_1 hydrochloride) was given intravenously. Examination three hours later revealed a subjective increase in the power of the grip on both sides. Dynanometer readings rose from 130 to 145 on the right, and from 125 to 135 on the left.

Over a period of seventeen days, 250 mg. of thiamin chloride was given intravenously in from 30 to 50 mg. doses. Very slight improvement appeared beyond that noted on the first day, and at the time of discharge, April 24, there was still definite weakness of adduction of both thumbs, and weakness of flexion and extension of the ankles and toes of about the same degree as on admission.

Case 3.—L. W., a man aged 28, had acute gonorrheal infection in 1933. He first visited the urologic outpatient department of the hospital in September 1937, complaining of a urethral discharge of seven weeks' duration. A smear was strongly positive for gonococci. A course of sulfanilamide at that time was followed by relief of symptoms. April 12, 1938, the discharge reappeared. April 18, sulfanilyl sulfanilamide therapy was started, and the patient received 40 grains (2.6 Gm.) a day up until about May 12, at which time the medication was discontinued because of the appearance of pain in both calves followed by weakness of the lower legs and both thumbs. He complained that he could not wind his watch or button his shirt and that he "shuffled" when he walked. Examination disclosed absent achilles tendon reflexes, hypo-active patellar reflexes, marked weakness of flexion and extension of the toes and ankles, marked weakness of adduction of the thumb and radial deviation of the index finger of both hands. Electrical examination June 24 revealed reversal of the polar formula in the muscles of the thenar eminence and a slow type of response to galvanic stimulation. The anterior tibial muscles presented hypo-irritability to faradic stimulation. There was no demonstrable sensory change. Only slight improvement in power has been noted in the ten weeks since the onset.

Case 4.—F. V., a man aged 67, with a diagnosis of carcinoma of the bladder, was started on sulfanilyl sulfanilamide therapy June 4 in an attempt to control a secondary infection of the bladder. He received 30 grains (2 Gm.) a day for six days and 40 grains (2.6 Gm.) a day for seven days, ending June 17. June 20 he experienced weakness in the right thumb and weakness of the feet in walking. Two days later there was weakness in the left thumb and both hands generally, so that he was forced to discontinue his work as shoemaker on June 23. Examination revealed marked weakness of adduction of the thumbs, ulnar and radial deviation of the index and middle fingers, and moderate weakness of flexion of the first three digits. There was no weakness of extension of the fingers or of wrist movements. The ankle jerks were absent. There was diminution in the appreciation of pain and vibratory sensation in the legs, which might well be accounted for by his age and varicosities of the leg veins. Moderate weakness of flexion and extension of the ankles and toes was present. There has been but slight improvement to date, one month after the onset.

COMMENT

Patient 1 has been seen frequently and at present, five months after the onset, has approximately 50 per cent of his former disability. Patient 2 is only slightly improved, according to a recent letter from the referring physician, Dr. W. F. J. Vogel of Riddlesburg, Pa., who has called our attention to recent articles in the German literature concerning neuritis following the use of the uliron brand of sulfanilyl sulfanilamide. This compound has enjoyed wide use in Germany and is reported as being very successful in the treatment of gonorrhea. Apparently the compound can be obtained by the public at the drug-store without the prescription of a physician.

Tietze [1] reports two cases of peroneal palsy due to uliron, characterized by weakness of the lower legs and pain in the calves. The achilles reflexes were absent. One patient presented weakness of the hands with atrophy of the interossei and the thenar and hypothenar muscle groups.

Lemke [2] presents five cases, strikingly similar to the four we have seen. All experienced pain in both calves and severe disturbance of gait. In all cases the achilles reflexes were absent. No abnormalities of sensation or electrical reactions were found. During the time of observation there was no improvement in any case. The total dosage of uliron varied approximately from 15 to 24 grains (1 to 1.5 Gm.) or more. The author stated that, as this complication occurred only in cases of gonorrhea, the neuritis might presumably be due to a toxin liberated by the destruction of the organisms. However, in the four cases cited in the present report, two were not cases of gonorrhea.

Euler [3] reports a death due to uliron and points out other ill effects from the drug, manifested by leukopenia, dermatitis, fever, albuminuria and peripheral neuritis.

Hüllstrung and Krause [4] describe severe polyneuritis in one case after the use of uliron and report that severe polyneuritis developed in pigeons fed with the same preparation.

1. Tietze, A.: Periphere Lähmungen nach Ulironbehandlung, München. med. Wchnschr. 85: 332 (March 4) 1938.
2. Lemke, R.: Ueber Neuritis nach Ulironmedikation, München. med. Wchnschr. 85: 452 (March 25) 1938.
3. Euler, H. E.: Zur Ulironfrage, München. med. Wchnschr. 85: 623 (April 29) 1938.
4. Hüllstrung, H., and Krause, F.: Deutsche med. Wchnschr. 64: 114-116 (Jan. 21) 1938.

Special Clinical Article

SENSITIVITY REACTIONS OF THE BLOOD AND BONE MARROW TO CERTAIN DRUGS

CLINICAL LECTURE AT SAN FRANCISCO SESSION

THOMAS FITZ-HUGH Jr., M.D.

Assistant Professor of Clinical Medicine, University of Pennsylvania; Chief of Hematologic Section, Medical Clinic, Hospital of the University of Pennsylvania

PHILADELPHIA

The idea that certain ordinarily useful drugs may, on repetition of normal doses, cause unexpected, profound and sometimes fatal idiosyncrasy reactions of the blood cells and hemopoietic tissues is relatively new. Prior to 1930 the nearest approach to this concept of drug allergy as a cause of serious hematologic injury was to be found in the literature of arsphenamine.[1] The older views of hematologic injury from drugs were based for the most part on supposedly orthodox toxic reactions.[2] These included anemia from poisoning by lead, mercury, arsenic, phenylhydrazine, trinitrotoluene, benzene and radium and methemoglobinemia from potassium chlorate, antipyrine, acetanilid, acetophenetidin, aniline and nitrobenzene. Although these reactions were viewed as toxic, it was recognized that individual susceptibility to such special effects existed, and to this extent something akin to idiosyncrasy was implied. After 1930, centering about the mystery of that relatively new disease called agranulocytic angina, there developed knowledge of hitherto unrecognized effects of acquired (drug) sensitivity involving the formed elements of the blood and bone marrow in very special and dramatic ways. The purpose of this presentation is to summarize and document the evidence on which this concept is based.

By way of definition the terms sensitivity, hypersensitivity and allergy are synonymous, and the term idiosyncrasy as here used means drug allergy. Drug allergy is considered to be a subdivision of general allergy, in which the same sequence is implied of prior, specific, sensitizing contact (probably mediated by a drug-protein combination)[3] followed, on repetition of contact with the drug, by the allergic response. This type of response bears no (necessary) resemblance to the drug's normal pharmacologic and toxic action and may be precipitated by a trifling dose.

The problem presented by such acquired states of sensitivity has three sides: first, identification of the reacting agents or drugs; second, identification and study of the specifically conditioned responses of the sensitized subject, and, third, investigation of the conditioning factors responsible for the sensitization. The last phase must include investigation of the still inexplicable fact that only one person out of many thousands to whom the drug is administered becomes sensitized or conditioned.

The mechanisms of acquired drug idiosyncrasy and of human allergy in general are obscure. Why prior contact produces sensitization in one person and not in others is the fundamentally unsolved problem. One "answer" is hereditary predisposition. For present purposes this may be called genetic conditioning. This factor is apparent in certain types of hemolytic anemia and of thrombocytopenic purpura.

In the case of agranulocytic angina women predominate, and in a few instances a cyclic (presumably menstrual) incidence of attacks has been observed. A similar mechanism appears in certain cases of thrombocytopenic purpura. This illustrates what one may designate hormonal conditioning. To this should be added (hypothetic) dysfunction of the liver (as a major organ of detoxification) and of the spleen (as a most important site of destruction of red cells and platelets).

The fatigue state and traumatic shock (after dental extractions, accidents and operations) loom large in the background of agranulocytic angina. Other toxemias, including putrefactive disturbances and various bacterial and protozoal infections, have been suspected. These may be grouped as toxic conditioning factors.

Certain deficiency states are suspect. The experiments of Rhoads constitute a brilliant demonstration of the possibilities of conditioned toxicity of a drug (aminopyrine) and of a common metabolite (indole) in the causation of hemolytic anemia through the mediating effects of vitamin deficiency.

AGRANULOCYTIC ANGINA (PERNICIOUS LEUKOPENIA)

The remarkable malady known as agranulocytic angina or pernicious leukopenia, first adequately described by Schultz in 1922, is now almost universally believed to be caused by an acquired sensitivity of the leukocytes, endothelium and leukopoietic tissues to certain drugs and other allergens (or potential toxins).[4] The pioneer observations which have established this point of view are those of Pepper,[5] Kracke[6] and Madison and Squier.[7]

The pathologic aspects of this disease include intimations of arrest of maturation, or anakmesis,[8] of the leukocytes in their production centers, which I[9] described in September 1931. To emphasize the analogies to pernicious anemia, which this condition in the bone marrow suggested, Krumbhaar and I[10] in 1932 proposed the designation pernicious leukopenia (instead of the etymologically objectionable and inaccurate terms that were and are employed). These analogies include the fact that the bone marrow in relapse in both diseases may be well supplied with progenitors of the cells which are lacking in the peripheral blood; the hemopoietic lesion in both diseases is reversible up to a certain point of terminal necrosis (or aplasia) of the bone marrow; the onset of remission in both is signalized by an outpouring of young cells from the bone marrow (the reticulocyte crisis in pernicious anemia and the

From the Hematologic Section of the Medical Clinic, Hospital of the University of Pennsylvania.

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1. Stokes, J. H.: Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1926, p. 315.

2. Ewing, James: Clinical Pathology of the Blood, Philadelphia, Lea Bros. & Co. 1901, pp. 96, 97 and 316. Pepper, O. H. P., and Farley, D. L.: Practical Hematological Diagnosis, Philadelphia, W. B. Saunders Company, 1933, pp. 343-351.

3. Landsteiner, Karl, and Jacobs, John: Studies on Sensitization of Animals with Simple Chemical Compounds, J. Exper. Med. 61:643-656 (May) 1935.

4. (a) Fitz-Hugh, Thomas, Jr.: The Etiology and Pathology of Agranulocytic Angina, Am. J. Clin. Path. 7:524-530 (Nov.) 1937. (b) Plum, P.: Agranulocytosis, London, H. K. Lewis & Co., Ltd., 1937.

5. Pepper, O. H. P.: Leukopenia: A Review, with Special Reference to Agranulocytic Angina, California & West. Med. 38:173-199 (Aug.) 1933.

6. Kracke, R. R.: Recurrent Agranulocytosis, Am. J. Clin. Path. 2: 385-390 (Sept.) 1932.

7. Madison, F. W., and Squier, T. L.: The Etiology of Primary Granulocytopenia (Agranulocytic Angina), J. A. M. A. 100:755-759 (March 10) 1934.

8. Darling, R. C.; Parker, Frederic, Jr., and Jackson, Henry, Jr.: The Pathology of the Bone Marrow in Agranulocytic Angina, Am. J. Path. 10:1-11 (Jan.) 1934.

9. Fitz-Hugh, Thomas Jr., in discussion on Waters, C. A., and Firor, W. B.: Am. J. Roentgenol. 37:747-748 (May) 1932.

10. Fitz-Hugh, Thomas, Jr., and Krumbhaar, E. B.: Myeloid Cell Hyperplasia of the Bone Marrow in Agranulocytic Angina, Am. J. M. Sc. 185:104-110 (Jan.) 1933.

myelocyte crisis in pernicious leukopenia); the anakmesis of the red marrow in pernicious anemia is based on a conditioned deficiency mechanism as defined by Castle, and the leukocytic anakmesis of pernicious leukopenia is based on some sort of acquired sensitivity (perhaps comparable to the Shwartzman reaction [11]), with certain drugs and possibly other substances acting as

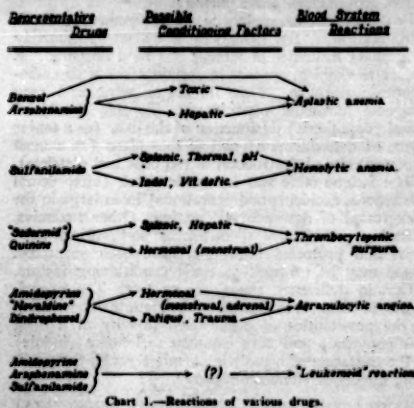

Chart 1.—Reactions of various drugs.

allergens or potential toxins in a perverse role, which I proposed in 1935 to designate as a mechanism of conditioned toxicity.[12]

Castle's concept of the conditioned deficiency has proved most fruitful. He showed that pernicious anemia is a deficiency disease which occurs despite normal diet, a specific starvation conditioned by a specific gastric defect. The picture thus invoked is like that of King Midas conditioned to starve in the face of plenty. I view the problem of drug allergy through the lens of Castle's hypothesis, somewhat enlarged and extended, as a mechanism of conditioned toxicity. Here the touch of King Midas conditions a result of poisoning or toxicity rather than of starvation or deficiency. When thus visualized, in sharper focus, the pattern of such mechanisms would seem to be composed of two interwoven threads, the one emanating from some drug or related substance (potential toxin or allergen) and the other representing influences which divert and modify the normal action pattern into an effect of conditioned toxicity.[13]

The drugs which have been suspected or proved to be idiosyncratic causes of individual attacks of agranulocytic angina are aminopyrine, dinitrophenol, arsphenamine and neoarsphenamine, gold salts, the diethylamine salt of stibanilic acid (neostibosan), acetophenetidin, sodium phenyldimethyl pyrazolon methylaminomethane sulfonate (novaldin),[14] a preparation containing about equal molecular parts of aminopyrine and 8-hydroxyquinoline-5-sulfonic acid (causalin),[15] quinine, cinchophen,[16] bismuth, 5,phenyl-5,ethyl-hydantoin (nirvanol), plasmoquine 8-dimethylamino-iso-amyl 6 methoxyquinoline (plasmochin) and sulfanilamide.[17] Other causes which I would classify as possible conditioning factors have been suggested: endocrine disturbance (estrus hormone, adrenal and hepatic), bacterial sensitization, cyclic toxemia (as with malaria, vaccination for typhoid) fatigue states, accidental and surgical trauma, genetic predisposition and vitamin deficiency.

In addition to the lesion of the bone marrow there is the phenomenon of the granulocytoclastic crisis,[12] which has to be considered in any concept of the pathologic changes of agranulocytic angina. This sudden temporary disappearance of granulocytes (chart 2) from the circulation occurs too quickly to be mediated by a bone marrow arrest mechanism. I have suggested that it may represent a shock-conditioned "sticking" of leukocytes to the vascular endothelium such as E. R. Clarke has demonstrated in his glass window preparations in the rabbit's ear. One or more peripheral episodes of this kind may be a necessary prelude to the arrest status of the bone marrow in the disease proper. It is even conceivable that, for the duration of the disease, all granular and many nongranular leukocytes which emerge from the bone marrow, lymph nodes and spleen immediately become "stuck" to capillary endothelium, where they are engulfed and destroyed. If this peripheral depopulation of leukocytes can be proved it may remove the necessity for hypothesizing a maturation arrest as the primary mechanism.

The following case (chart 2) illustrates the granulocytoclastic crisis of acquired sensitivity to aminopyrine after recovery from agranulocytic angina.

Case 1.—Miss R. N., aged 32, who had dysmenorrhea and menstrual migraine, had taken an occasional dose of a preparation of varying composition called midol,[18] of 5 allyl 5 isopropylbarbiturate of aminopyrine (allonal) and of aminopyrine for several years without ill effects. Her present desperate illness, however, began after taking four tablets of

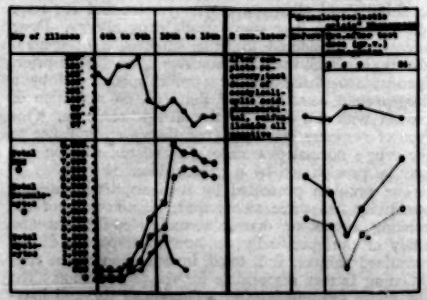

Chart 2.—Course in case 1.

allonal and some acetylsalicylic acid for menstrual cramp and "cold." She was given sulfanilamide but did not improve. A blood count on the fourth day established the diagnosis of agranulocytic angina. Recovery was inaugurated the ninth day.

11. Shwartzman, Gregory; Klemperer, Paul, and Gerber, I. E.: The Phenomenon of Local Tissue Reactivity to Bacterial Filtrates, J. A. M. A. 107: 1946-1951 (Dec. 12) 1936.

12. Fitz-Hugh, Thomas, Jr.: Pernicious Leukopenia (Agranulocytic Angina): Clinical and Experimental Background and Present Status, M. Clin. North America 19: 103-122 (July) 1935.

13. This is of course merely a restatement of the fundamental problem of all biologic reaction. It is useful only so far as it aids in the discovery and definition of conditioning factors.

14. Kinney, Jr. G.: Agranulocytosis Associated with the Administration of "Novaldin," J. A. M. A. 108: 637-638 (Feb. 20) 1937.

15. Jackson, Henry, Jr.: Two Cases of Agranulocytosis Following the Ingestion of Causalin, to be published.

16. Shapiro, Shepard, and Lehman, Lester: Agranulocytosis Following Ingestion of Cinchophen, Am. J. M. Sc. 190: 705-709 (Nov.) 1935.

17. Bertz, J. G. C.: Death from Agranulocytosis After Treatment with Proximal Plasmoquin, Lancet 1: 1519-1520 (June 26) 1937. Schwartz, W. F.; Curtis, F. G., and Kolansky, Simon: Fatal Granulocytopenia from Sulfanilamide, J. A. M. A. 110: 368-370 (Jan. 29) 1938.

18. Midol, Bureau of Investigation, J. A. M. A. 110: 1942 (June 4) 1938.

THROMBOCYTOPENIC PURPURA

The symptom complex of purpura, whether due to thrombocytopenia, to capillary damage or to both, may occasionally be traced to an allergic basis. It has long been known that certain drugs (notably iodides, phenolphthalein, barbiturates, benzene and arsphenamine) may cause a purpuric rash. For a good many years (since Glanzmann) the analogy of anaphylaxis has been invoked to explain certain types of purpura, under the designation anaphylactoid purpura. The modern concept,[19] to which I would direct attention, is that of true thrombocytopenic purpura caused by an allergic reaction to certain foods and drugs. Here again one is reminded of the Shwartzman phenomenon.

The following case illustrates an interesting combination of conditioning factors, allergic, menstrual and splenic, which may exemplify some of the fundamental bases of so-called Werlhof's disease. This case also makes one consider the possibility that the spleen in this disease may produce a sensitizing substance, the removal of which is tantamount of nonspecific desensitization.[20]

CASE 2.—A girl aged 16, who had had recurrent menorrhagia, epistaxis and hives for a year, showed on examination the classic picture of chronic thrombocytopenic purpura. The allergy survey disclosed a positive reaction to the cutaneous tests for pork, chocolate and grapefruit. Elimination of these substances was followed by moderate improvement. Test feeding with chocolate produced a drop in the platelet count from 50,000 to 20,000 within a few hours but no fresh purpura. However, later the patient ate some chocolate cake during menstruation. This was followed promptly by a fresh shower of purpura and exaggerated menorrhagia. (The suggestion here of a menstrually conditioned enhancement of the capillary platelet idiosyncrasy to chocolate is hard to deny.[21]) Despite subsequent adherence to orders this patient continued in a smoldering state of thrombocytopenic purpura, and after six months splenectomy was performed. The results were completely satisfactory, with disappearance not only of the hemorrhagic trouble but also of the hives even though she occasionally eats the forbidden foods.

Thrombocytopenic purpura due to idiosyncrasy to allylisovalerylurea (sedormid),[22] quinine,[23] quinine and ergot,[24] acetophenetidin (phenacetin) and aminopyrine [25] has been reported in recent years. A study of bone marrow, spleen and other appropriate tissues in cases of this shocklike thrombocytopenic reaction is lacking.[26] In some of the cases positive cutaneous reactions were obtained. In others a drop in platelet content and a positive hemorrhagic exacerbation following a test dose of the drug served to prove the causal relationship. Here again the mechanism of sequestration (and destruction) of platelets caused by some widespread alteration of reticulo-endothelium is probably of primary importance. Possible conditioning factors in this thrombocytopenic reaction pattern which have received serious consideration include dysfunction of the liver and spleen, cyclic menstrual hormone effects, genetic conditioning and vitamin deficiencies.

HEMOLYTIC ANEMIAS AND SO-CALLED APLASTIC ANEMIAS

The hemolytic effect of certain drugs, chemicals, toxins and serologic incompatibilities has long been known. Phenylhydrazine, trinitrotoluene, arseniuretted hydrogen (hydrogen arsenide) and n-propyl disulfide are supposedly direct hemolytic poisons. So too are snake venoms, saponins and certain bacterial toxins. The hemolytic effect of incompatible blood serum, of favism, of blackwater fever and of paroxysmal hemoglobinuria is in a different category. This mechanism is one of antigen-antibody reaction, related to immunity, anaphylaxis and allergy. Acute hemolytic anemia of this type occurs as an occasional idiosyncratic effect of sulfanilamide,[27] dinitrophenol, acetanilid and antipyrine in human beings; a probably similar mechanism produces the hemolytic anemia from aminopyrine and crystalline indole in dogs [28] specifically conditioned by a defective diet.

In addition to peripheral hemolysis, direct poisoning of the bone marrow, with consequent aplastic anemia, may be caused by drugs (lead, mercury, bismuth, arsenic, arsphenamine, benzene), by certain bacterial toxins and by radium and x-rays. It is becoming more and more obvious, however, that aplastic blood pictures do not always indicate aplastic marrow. There is often a marked discrepancy between the two.[29] The modern emphasis is shifting from the sterile hypothesis of primary aplasia to such factors as peripheral sequestration, destruction, loss, toxic arrest of maturation and breakdown of delivery mechanism, although it is still admitted that a terminal stage of fatty or aplastic marrow may result from any of these processes. The drugs that best illustrate this fact are arsphenamine [30] and sulfanilamide, which may produce hemolytic anemia, agranulocytosis, thrombocytopenic purpura or all three at once.

The work of Rhoads and Miller [28] is a brilliant pioneer elucidation of one of the (probably many) conditioning factors which may alter the normal pattern of drug effect. Their experiments prove that dogs conditioned by deficient diet (the blacktongue diet) become seriously anemic when given aminopyrine or crystalline indole, whereas not the diet or aminopyrine or indole alone is similarly effective. This work points clearly to the fact that not only a drug but also a common metabolite may, through the mediation of a conditioning mechanism, cause profound hemopoietic disturbance. Furthermore, these experiments will doubtless reopen the old problem of autointoxication, with the production and disposal of indole (and related substances) once more in the spotlight of clinical interest.

19. Squier, T. L., and Madison, F. W.: Thrombocytopenia Purpura Due to Food Allergy, J. Allergy 8:143-155 (Jan.) 1937.

20. This is not a recommendation for splenectomy as a cure for the allergic state in general (or even as the treatment of choice in all cases of Werlhof's disease.

21. Minot, G. R.: Purpura Hemorrhagica with Lymphocytosis, Am. J. M. Sc. 192:445-456 (Oct.) 1936. Brinck, Joachim, and Patrunky, Max: Hypervarian Hemorrhagic Diathesis, Deutsche med. Wchnschr. 63:386-388 (March 5) 1937.

22. Loewy, F. E.: Thrombocytopenic Hemorrhagic Purpura Due to Idiosyncrasy Toward the Hypnotic Sedormid, Lancet 1:845-848 (April 21) 1934.

23. Beiglböck, Wilhelm: Ein Fall von thrombopenischer Purpura bei echter Chininüberempfindlichkeit, Ztschr. f. klin. Med. 131:308-316, 1937.

24. Peskin, M. M., and Miller, J. A.: Quinine and Ergot Allergy and Thrombocytopenic Purpura, J. A. M. A. 108:1737-1740 (May 26) 1934.

25. Kracke, R. R.: Thrombocytopenic Granulocytopenia, Southern M. J. 28:448-455 (March) 1932.

26. An exception to this statement is the study of the sternal marrow by W. Hadorn (Schweiz. med. Wchnschr. 68:1273-1276 (Dec. 12) 1936) who, contrary to the majority of observers, expressed the opinion that this effect of sedormid is unreliable, toxic and not idiosyncratic, despite the fact that in one of his cases the condition developed after only two tablets of sedormid.

27. Harvey, A. M., and Janeway, C. A.: The Development of Acute Hemolytic Anemia During the Administration of Sulfanilamide, J. A. M. A. 108:12-16 (July 3) 1937. Jennings, G. H., and Southwell-Sander, G.: Anaemia and Agranulocytosis During Sulfanilamide Therapy, Lancet 2:898-901 (Oct. 16) 1937. Kahn, S. E.: Acute Hemolytic Anemia During Treatment with Sulfanilamide, J. A. M. A. 109:1003-1006 (Sept. 25) 1937. Long, P. H., and Bliss, Eleanor A.: Use of Sulfanilamide, South. M. J. 30:479-487 (May) 1937.

28. Rhoads, C. P.: Effect of Indole on Hematopoiesis in Dogs Fed Deficient Diets, Proc. Soc. Exper. Biol. & Med. 36:652-654 (June) 1937. Rhoads, C. P., and Miller, D. K.: Effect of Diet on Susceptibility of Canine Hematopoietic System to Damage by Amidopyrine, ibid. 36:654-656 (June) 1937.

29. Rhoads, C. P., and Barker, W. H.: Refractory Anemia, J. A. M. A. 110:794-795 (March 12) 1938. Zanetty, A. F.: Sternal Puncture in Pernicious and Achrestic Anaemia, Lancet 2:1365-1367 (Dec. 11) 1937.

30. Brendle, I. D., and Singerman, Isidor: Acute Aplastic Anemia Complicating Arsphenamine Therapy, J. A. M. A. 98:1725-1726 (May 14) 1932.

Another demonstration of conditioning mechanism has come to light in recent studies of paroxysmal nocturnal hemoglobinuria (Marchiafava type), in which the slight change in plasma p_H (which results from the pulmonary hypoventilation of sleep) is sufficient to activate serum lysin so that hemolysis of the "sensitized" cells is produced.[31] In certain cases of these conditions splenectomy is beneficial, just as it is in certain cases of thrombocytopenic purpura and in most cases of familial acholuric jaundice. With each of these one is tempted to speculate on the possible role of the spleen in conditioning such hematologic sensitization.

LEUKEMOID REACTIONS

Abnormal leukocytosis due to idiosyncrasy to a drug is occasionally encountered after the use of arsphenamine, aminopyrine and sulfanilamide. I have observed several monocytic leukemoid reactions to arsphenamine. I have recently seen a boy who presented a convincing picture of acute monocytic leukemia, from which recovery occurred, which was apparently due to idiosyncrasy to aminopyrine. A leukemoid monocytosis may also mark the recovery phase of aminopyrine-induced agranulocytic angina. Likewise sulfanilamide may occasion a sharp polymorphonuclear leukocytosis, especially in association with drug fever and rash.

Drugs Which May Cause Acquired Hematologic Sensitivity

1. Acetanilid	II		11. Gold salts	I	III IV
2. Amidopyrine*	II III IV V		12. "Neostibosan"		IV
3. Antipyrine	II		13. "Sirvanol"		IV
4. Arsphenamine	I II III IV V		14. "Novaldine"		IV
5. Benzene	I II III IV V		15. Phenacetin		IV
6. Bismuth	III IV		16. "Plasmochin"		IV
7. "Causalin"*	IV		17. Quinine	II	III IV V
8. Cinchophen	IV		18. "Sedormid"*		III
9. Dinitrophenol	IV		19. Sulfanilamide	I	II III IV V
10. Ergot	III				

Hematologic Disorders Sometimes Caused by Drug Sensitivity
(Arabic numbers refer to drugs; Roman numerals, to diseases)

I. Aplastic anemia: 4, 5, 11, 19
II. Hemolytic anemia: 1, 2, 3, 4, 5, 17, 19
III. Thrombocytopenic purpura: 2, 4, 5, 6, 10, 11, 17, 18, 19
IV. Agranulocytic angina: 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 19.
V. Leukemoid reactions: 2, 4, 5, 17, 19

* See also list of proprietary remedies.

TESTS FOR HEMATOLOGIC SENSITIVITY TO DRUGS

The ordinary cutaneous tests for sensitivity to drugs are of little value in the case of hematologic sensitivity. Often the reaction is negative when the clinical evidence and results of the test dose method are positive.[32] Furthermore, marked cutaneous sensitivity may be demonstrated in a patient who exhibits no hematologic idiosyncrasy.[33] The intradermal serum-drug test of Dameshek [34] is the most sensitive procedure for the study of agranulocytic angina but is apparently not free from danger.

The results of the test dose method constitute the most important item of proof that can be adduced in establishing the guilt of a drug suspected of having caused a given hematologic reaction, but this method also has limitations. In a few instances a temporary negative phase has been demonstrated, although usually sensitization, once acquired, seems to be permanent. For practical purposes, the test is applicable only to survivors. It is a tedious procedure for both patient and physician. Finally, it is not entirely without danger, especially in the agranulocytic group, although I know of no fatalities. The test consists in the administration of a small dose of the suspected drug, preceded and followed by observations of temperature, pulse, clinical signs and symptoms and the obtaining of appropriate hematblogic data (leukocyte counts and differential counts in cases of agranulocytic angina, platelet counts in cases of purpura and red cell and hemoglobin estimations and determinations of the icterus index in cases of anemia). The hematologic reactions, when they occur, are usually prompt (i. e. within a few hours) but may be delayed for several days. The limits of normal variation and the limits of error of the methods must be clearly recognized in assessing the hematologic data. No conclusions should be drawn from minor variations. These limitations invalidate [35] some of the data of the "leukopenic index," which is an allergist's adaptation of the procedure described.

PREVENTION AND TREATMENT OF HEMATOLOGIC REACTIONS DUE TO SENSITIVITY TO DRUGS

The problem of prevention of the rare but sometimes desperate hematologic reactions to drugs is a most difficult one. The fact that a drug may have been successfully and uneventfully administered in normal doses to a given patient for a certain length of time in no way guarantees that sudden and unexpected sensitivity may not become manifest. The syphilologist, with his armamentarium of specifics, has had to face this problem for years. The disease against which his "big guns" are trained is such a universally dreaded enemy that the profession (and the public) are not panic stricken by an occasional ricochet that destroys the patient instead of the disease. This may possibly be true also of the use of quinine against malaria, neostibosan against kala-azar and sulfanilamide against hemolytic streptococcus invasion, gonorrhea and meningitis. The gravity of the disease and the effectiveness of the remedy justify the slight risk involved. But can one say the same for aminopyrine and its host of proprietary mixtures? [36] or novaldin? or dinitrophenol? or causalin? or sedormid? These do not seem to be important weapons, and even though they may be administered without mishap to the majority of patients their purposes may be served by drugs which do not produce these serious disorders of the blood system.

One means of prevention, therefore, lies in the proper selection of sedatives and in avoidance of drugs of unnecessary potency when inert placebo medication may do as well. Another lies in avoidance of proprietary remedies of which the composition is not explicit. It is important when using an active drug to be alert to premonitory manifestations of idiosyncrasy and to assess the gravity of these reactions as weighed against

31. Dacie, J. V.; Israels, G., and Wilkinson, J. F.: Paroxysmal Nocturnal Hemoglobinuria of the Marchiafava Type, Lancet 1:479-482 (Feb. 26) 1938.

32. Fitz-Hugh, Thomas, Jr.: Drug Idiosyncrasy, with Special Reference to Amidopyrine, as a Cause of Agranulocytic Angina, Ann. Int. Med. 9:148-155 (Aug.) 1934.

33. Strauss, M. B.: Allergy to Amidopyrine, New England J. Med. 215:177-179 (July 30) 1936.

34. Dameshek, William, and Colmes, Abraham: The Effect of Drugs in the Production of Agranulocytosis with Particular Reference to Amidopyrine Hypersensitivity, J. Clin. Investigation 15:85-97 (Jan.) 1936.

35. Long, C. F.: Leukocyte Behavior During Gastric Analysis, J. A. M. A. 109:23-25 (July 3) 1937.

36. A partial list of proprietary remedies which, according to available information, are said to contain aminopyrine: allonal, alphebin, amarbital, amidol, amido-neonal, amidonine, amidophen, amidos, amidotal compound, amifeine, aminol, ampheonal, ampydin, amytal compound, analgia, antabo, arthriol, baramid, barbamid, barbipyrin, barbromid (Columbia) benzedo compound, cibalgine, cinchopyrine, compral, cronal, dianalgin, ditonal, dymen, dyaco, eu-med, gardan, gramin, gynalgos, hexin, ipral-amidopyrine, kalmo, khimavid, klimovex, kolgin, lumbordrin, midol, mylin, neolin, neonal-compound, neuredyne, nod, opticalidon, perigen, phenamidal, phen-amidol, phenopyrine, prokliman, pyrabyl, pyramidon, pyraminal, sal-ethyl-carbonate compound, sedalyl, seegis, yeast-vite, veramon. The proprietary remedies "novaldin" and "causalin" contain a slightly modified aminopyrine structure.

the gravity of the disorder under treatment. It is also well to avoid unnecessary combinations of drugs known to have similar idiosyncratic potentialities. Frequent blood counts should be made when hematologic idiosyncrasy may be anticipated. Finally, when therapy with potentially dangerous drugs is necessary, careful attention should be given to the patient's nutrition and general vital status.

The treatment of the damage, once initiated, is best accomplished by rigid prohibition of all probable medicinal offenders. The first rule is "primum non nocere." Palliative therapy should be limited to a few agents such as sodium bromide, sodium salicylate, codeine sulfate or a little morphine. An appropriate vitamin supply should be insured. Parenteral injection of liver extract, crystalline vitamin B_1 and ascorbic acid may be used instead of, or in addition to, oral therapy. Transfusions of blood are sometimes life saving. The new yellow bone marrow concentrate for oral administration is, I believe, of real value in the treatment of agranulocytic angina. Iron, calcium, bile salts and hydrochloric acid are sometimes indicated. The intravenous administration of dextrose or saline solution is often helpful. Even splenectomy has a place in an occasional case of thrombocytopenic purpura of apparently allergic type (case 2) and in an occasional case of refractory anemia of the type discussed by Rhoads and Barker.[29]

Since patients with serious hemopoietic injury are easy prey for "opportunist bacteria," their treatment may occasionally warrant specific serotherapy or chemotherapy. Such therapy is justifiable if the invading organisms are of a single predominating strain against which a truly specific agent is available and if the invasion has assumed serious proportions (e. g. septicemia or pneumonia). I have observed the successful termination of secondary hemolytic streptococcus septicemia with sulfanilamide therapy in a case of aminopyrine-induced agranulocytic angina [48] and in a case of pancytopenia of undetermined cause, despite the fact that sulfanilamide has itself been incriminated as a cause of agranulocytosis and pancytopenia. It is important to remember that the patient may succumb, even after hematologic remission is well under way, to infection acquired during relapse.

CONCLUSIONS

1. Specific hematologic reaction patterns of acquired sensitivity to certain drugs constitute a relatively modern observation.

2. These reaction patterns include certain cases of agranulocytic angina, thrombocytopenic purpura, hemolytic anemia, pancytopenia and leukemoid reactions.

3. These idiosyncratic effects of drugs (and possibly other acquired allergies) may advantageously be viewed as conditioned toxicities.

4. The fact that certain drugs, through mechanisms of acquired sensitivity, may produce these disorders suggests that other substances (food, bacterial products and metabolites) may occasionally behave in a similar fashion.

5. The search for possible factors which may condition hematologic sensitization has led under various circumstances to suspicion of disorders of the liver and spleen, states of vitamin deficiency, genetic factors (atopy), endocrine influence, intestinal putrefaction, states of fatigue and shock and prior hemopoietic disease.

2016 DeLancey Street.

Special Article

THE MEASUREMENT OF AIR CONDITIONS

CAREY P. McCORD, M.D.
AND
WILLIAM N. WITHERIDGE, M.S.
DETROIT

With the advent of an increasing use of artificially conditioned atmospheres in office buildings, auditoriums, department stores, apartment buildings and to some extent individual dwellings, it appears desirable to have some physical means of anticipating the reactions of a group of persons to a given set of air conditions. The individual may have facilities at his command to regulate indoor air conditions according to his personal needs or desires, but comfort air conditioning for a large group is successful only when satisfaction is obtained for the majority of occupants.

The physician, the layman, the engineer, in fact every one entrusted with the control of or called on to judge the suitability of air conditions, should understand the use of modern instruments designed to supplement the ordinary and very often inadequate "dry-bulb" thermometer and should be familiar with the optimal conditions for human comfort and efficiency as indicated by these more reliable instruments, so far as they are known at this time.

It is our intent in this report to describe some of the more important instruments and charts devised for this purpose and to appraise the reliability of various measures of atmospheric conditions as indexes of human comfort over a wide range of conditions.

In the first report of this committee [1] it was pointed out that there are five principal factors determining the quality of the air and its effect on human comfort: air temperature, humidity, air movement, radiation and cleanliness of the air.

The early concept of an adequate index of environmental warmth was simply the air temperature as indicated by an ordinary mercury-in-glass or alcohol-in-glass thermometer. Air temperature even now is considered a fairly reliable measure of warmth when the factors humidity, air movement and radiation vary within a narrow range. The difficulty of creating satisfactory air conditions on the basis of temperature alone has stimulated extensive research during the past two decades to determine, if possible, a convenient single index combining the effects of temperature, humidity, air movement and radiation. The major requirement of such an index is that it should correlate well with the human response to a wide range of air conditions. As secondary considerations, it should not be too difficult to determine or compute, nor should it require too complex or cumbersome instruments for its measurement.

Before discussing the more successful combined indexes of warmth and comfort that have been developed, we shall review separately air temperature,

From the Bureau of Industrial Hygiene, Detroit Department of Health. This is the sixth in a series of reports prepared by the American Medical Association's Committee to Study Air Conditioning. Members of the committee are William F. Petersen, Chicago; Constantin P. Yaglou, Boston; Emery R. Hayhurst, Columbus, Ohio; Horatio B. Williams, New York, and Carey P. McCord, Detroit, chairman.

1. Yaglou, C. P.: Physical and Physiologic Principles of Air Conditioning, J. A. M. A. 108: 1708 (May 15) 1937.

humidity, air movement and radiation with particular reference to the instruments used for their measurement.

AIR TEMPERATURE

Air temperature, technically known as "dry-bulb" temperature, is usually measured by an ordinary glass thermometer which is not affected by the humidity of the air. Since the glass bulb of the ordinary mercury or alcohol thermometer is affected by radiant heat, it should be shielded from the "view" of objects or surfaces whose temperatures are much above or below the air temperature. As an alternative, the thermometer bulb can be silvered to reflect radiant heat. Gas thermometers, electrical resistance thermometers and thermocouple instruments are inherently laboratory or industrial devices and cannot replace the simpler liquid-in-glass type for air conditioning applications. Bimetallic elements are used in some types of indicating or recording thermometers, but in general they are not as sensitive to small changes of temperature as the mercury or alcohol thermometers.

Fig. 1.—Sling Psychrometer (courtesy Taylor Instrument Companies).

HUMIDITY

"Absolute humidity" is the amount of water vapor present in the air. It is usually expressed in grains of moisture per cubic foot or per pound of air (7,000 grains = 1 pound).

By definition, "relative humidity" is the ratio of the actual partial pressure of the water vapor in the air to the saturation pressure at the dry-bulb temperature. For practical purposes, relative humidity is taken as the ratio of absolute humidity to the maximum amount of water vapor that a given volume of air will hold at the given dry-bulb temperature, since this ratio is approximately the same as the ratio of vapor pressures. The capacity of the air for holding moisture varies directly with dry-bulb temperature. For example, a cubic foot of air can hold 1.3 grains of moisture at 20 F., 8 grains at 70 F. and 20 grains at 100 F.

Determination of Humidity.—The humidity of the air is usually determined by means of a "sling psychrometer" (fig. 1). This consists of a dry-bulb and a wet-bulb thermometer mounted side by side on a metal strip pivoted to a handle. The cloth wick covering the wet bulb is moistened, preferably with distilled water, and the instrument is whirled at a peripheral speed of 1,000 feet or more per minute. The wet-bulb thermometer is read at frequent intervals until the lowest temperature is obtained. Knowing the dry-bulb and wet-bulb temperatures, either the absolute or the relative humidity can be determined easily from "psychrometric" tables or charts. The lower the moisture content of the air, the greater will be the difference between the dry-bulb and wet-bulb temperatures (this difference is called "wet-bulb depression"). In a saturated atmosphere, on the other hand, no evaporation would be possible, and the wet-bulb thermometer would therefore show the same temperature as the dry-bulb thermometer.

In a motor driven psychrometer, the air is blown across the wet bulb by a small fan. Stationary wet-bulb hygrometers in which no provision is made for the rapid ventilation of the wet bulb are subject to great errors. Carrier and Lindsay[2] explain this fact as follows:

> Without unusual precautions, the stationary hygrometer is an exceedingly unreliable instrument for even the most ordinary work, since the drafts and convection currents existing in a heated room are uncertain and consequently the corrections to be applied are uncertain. This is particularly to be emphasized since the errors on a stationary wet-bulb thermometer occur on the most sensitive portion of the correction curves; i. e., at the very low velocities. It is shown, for instance, that the error of the stationary wet-bulb thermometer will vary from about 5 per cent at 120 F. to 33 per cent at 32 F. In ordinary room conditions velocities from zero to 50 feet per minute may exist without being . . . noticed as a draft. At a 50 degree wet-bulb temperature, the error will vary from 24 per cent in still air to 9 per cent at 50 feet per minute.

Human hair, wood, cellulose materials, goldbeaters' skin and paper impregnated with deliquescent salts are among the hygroscopic substances that have been used as the expanding and contracting elements of humidity control devices or dial indicators. Most hygrometers of this type need frequent recalibration particularly following exposures to unusual conditions, which often produce large after-effects and which may cause permanent damage. Such hygroscopic humidity indicators are satisfactory when frequently checked or recalibrated against a standard sling psychrometer. Gravimetric or volumetric chemical methods are sometimes used in the laboratory for determining humidity, but they are more laborious than sling psychrometer methods.

Dew-Point Temperature.—This is an important hygrometric factor from the standpoint of moisture condensation. It is the temperature to which a given sample of air must be cooled in order that condensation of the water vapor within it may begin. When air is at the dew point, the dry-bulb, wet-bulb and dew-point temperatures are identical. If the air is cooled below the dew point, some of the water vapor will condense and all three temperatures will be correspondingly lowered. This is actually what takes place on window glass in cold weather or when the air is dehumidified by cooling in an air conditioner. The temperature of the cold surface or substance must be slightly below the dew-point temperature of the air before condensation can occur thereon.

The dew-point temperature is usually determined from sling psychrometer readings by means of a chart or table. Direct determinations of the dew point for the estimation of relative or absolute humidity are subject to considerable errors and are seldom used in place of wet-bulb determinations.

2. Carrier, W. H., and Lindsay, D. C.: The Temperature of Evaporation of Water into Air, Tr. Am. Soc. Mech. Engrs. 46:729, 1924.

AIR MOVEMENT

About a century ago Heberden [3] and Reid [4] pointed out that the ordinary thermometer alone is not reliable as an indicator of comfort and suggested that air movement as well as air temperature should be measured in estimating the relative comfort of various air conditions. The value of air movement in relieving discomfort arising from high air temperatures or intense radiation is now well known.

Air Movement in Rooms.—It is frequently desirable to trace the course and destination of the air supplied to a room or to determine the source and direction of drafts. Several simple devices are available, such as small paper or cloth flags, silk threads, small balloons, candle flames, tobacco smoke or smoke clouds generated by hand aspirated smoke tubes of the Bureau of Mines type.[5] In these smoke tubes, air is forced by a rubber aspirating bulb through a glass tube containing pumice stone saturated with anhydrous tin tetrachloride or titanium tetrachloride, and a dense white cloud issues from the tube and travels with the air currents. A similar smoke cloud device produces a dense ammonium chloride fume by combining, in a small Y nozzle, the ammonia and hydrogen chloride gases from separate small bottles containing these gases in solution.

Of particular importance in comfort air conditioning are the continuously changing turbulent air currents which vary in velocity from 10 to 100 feet per minute and which defy measurement by any type of purely mechanical anemometer. In fact "air movement," as used in combination with temperature, humidity and radiation in this report, means the summated or integrated movement of air across a body from all directions. Thermal types of anemometers are well suited for integrating turbulent air currents, and the instrument most widely used for this purpose at present is the "katathermometer."

Standard Katathermometer.—Early in the nineteenth century Leslie,[6] and a few decades later Heberden,[3] used thermometers for measuring air velocities utilizing apparently the same principle as that of the modern katathermometer (fig. 2). This instrument was introduced by Hill [7] in 1914 as a physical instrument with possibilities of simulating to some degree the dynamic function of the body in losing heat by radiation, convection and evaporation. It is now generally accepted that neither the dry nor wet "kata cooling powers" are adequate indexes of comfort, since their response to air conditions differs in several ways from the response of the human body to the same conditions.[8] Air currents exert a greater cooling effect on the relatively small bulb of the katathermometer than on the human body. The human body, under ordinary conditions, is neither completely dry, as the dry katathermometer, nor completely wet, as the wet katathermometer, and therefore does not react the same as do these two instruments. Only under special limited conditions will the dry and wet katathermometers give reliable indications of human response to air conditions.

Because of its sensitivity to air movement the dry katathermometer is valuable as an anemometer, provided the walls and objects surrounding the instrument are at substantially the same temperature as the moving air. If the bulb of the katathermometer is silvered, errors due to radiation between the bulb and its surroundings usually can be neglected. By determining both the air temperature and "kata cooling power" of the air, air movement can be computed from equations or obtained more conveniently from the calibration chart (fig. 3) developed by Yaglou and Dolcoff under accurately controlled air conditions.

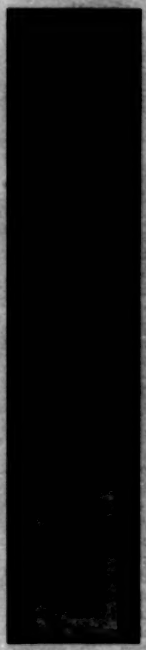

Fig. 2.—Katathermometer (courtesy E. E. P. Ehner, Winnetka, Ill.).

The katathermometer is a specially constructed alcohol thermometer, with a cylindric bulb about three quarters of an inch in diameter and 1½ inches long. The stem is 8 inches long, and ordinarily it is etched at only two points, 95 and 100 degrees F. An enlargement of the bore at the top of the stem serves as a safety reservoir in case of accidental overheating and also permits the instrument to be heated in a vacuum bottle considerably above 100 F. so that by the time its bulb is dried and suspended in the desired position it has acquired a uniform rate of cooling. The time required for the alcohol meniscus to fall from the 100 to the 95 degree mark is then observed, and the "kata factor" marked on the stem of the instrument by its manufacturer is divided by this time in seconds, giving the "cooling power" of the air in millicalories per square centimeter of bulb surface per second at a mean temperature of 97.7 F.

A high temperature katathermometer which cools from 130 to 125 F. is useful in determining air velocity when the air temperature exceeds 90 F.[9]

Electrical Anemometers.—Several types of electrically heated instruments are available, all depending in principle on the cooling of a hot body. Among these are Hill's electrical katathermometer,[10] several types of "hot wire" anemometers,[11] Hill and Griffith's "calometer," [12] Weeks' "coolometer,"[13] a thermocouple anemometer [13] and Yaglou's "heated thermometer

3. Heberden, William: An Account of the Heat of July 1825, Together with Some Remarks upon Sensible Cold, Phil. Tr. Roy. Soc. London, 1826, pt. II, p. 69.
4. Reid, D. B.: Illustrations of the Theory and Practice of Ventilation, London, Longmans, Brown, Green & Longmans, 1844.
5. Katz, S. H., and Bloomfield, J. J.: Sulfur Trioxide Smoke Tubes for Determining Air Currents, Report of Investigations 2505, U. S. Bureau of Mines, July 1923.
6. Leslie, J.: An Experimental Inquiry into the Nature and Propagation of Heat, London, J. Mawman, 1804.
7. Hill, Leonard: (a) Report on Ventilation and the Effect of Open Air and Wind on the Respiratory Metabolism, Report of the Local Government Board of Public Health, No. 100, New Series, 1914. (b) The Science of Ventilation and Open-Air Treatment: Part I, Special Report 32, Medical Research Council (Great Britain), London, H. M. Stationery Office, 1919-1920. (c) The Katathermometer in Studies of Body Heat and Efficiency, Special Report 73, Medical Research Council (Great Britain), 1923.
8. McConnell, W. J., and Yaglou, C. P.: The Katathermometer: Its Value and Defects, Pub. Health Rep. 39:2293 (Sept. 3) 1924; Bureau of Mines, Report of Investigations, No. 2565, 1924.
9. Angus, T. C.; Hill, Leonard, and Soper, H. E.: A New Katathermometer for Hot Atmospheres and a Simplified Method of Computing, J. Indust. Hyg. 19:164 (Feb.) 1938.
10. Hill, Leonard: An Electrically Heated Katathermometer and Comparison of Wet Kata with Wet Bulb, Proc. Physiol. Soc., J. Physiol. 58:84 (Jan. 31) 1930.
11. Over, E.: The Measurement of Air Flow, London, Chapman & Hall, Ltd., 1927.
12. Weeks, W. S.: A New Instrument for Measuring Cooling Power—The Coolometer, J. Indust. Hyg. 13:261 (Sept.) 1931.
13. American Instrument Company, Inc., 8010 Georgia Avenue, Silver Spring, Md.

anemometer."[14] Although these instruments are noted for their sensitivity to low air velocities, either the elaborate apparatus required for their use or the convection currents caused by their own heating elements, or both, have detracted much from their usefulness, with the possible exception of the heated thermometer anemometer.

The heated thermometer anemometer (fig. 4) is a low temperature hot wire instrument possessing many

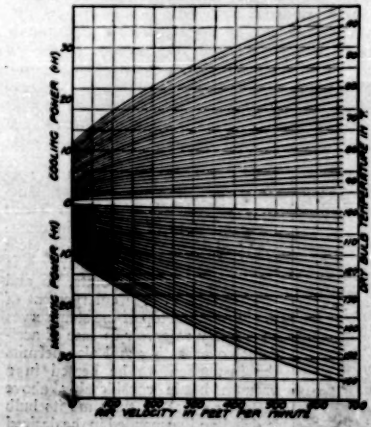

Fig. 3.—Chart for determining air velocity from readings of the standard katathermometer (Yaglou, C. P., and Dokoff, K.: Calibration of the Katathermometer Over a Wide Range of Air Conditions, J. Indust. Hyg. 2:1:278 [Oct.] 1939).

of the desirable characteristics of the conventional hot wire anemometers and much of the simplicity of the standard katathermometer. The temperature of the wire is only from 10 to 40 degrees F. above the air temperature and it is indicated on an ordinary thermometer, around the bulb of which the wire is wound. Small dry cells furnish the heating current, and the voltage is regulated by a rheostat; this auxiliary apparatus can be assembled in a small box. The readings to be observed are the temperatures of both the heated and an unheated thermometer together with the voltage used. Air velocity is obtained by a table or chart or is computed by an equation. By varying the voltage one can measure accurately any air velocity between 10 and 6,000 feet per minute. The instrument automatically compensates for ordinary variations of air density due to temperature changes and is negligibly affected by humidity, radiant heat and convectional currents of its own. It offers little or no obstruction to air flow but requires correction for partial immersion of its stem when used in small pipes.

Mechanical and Pressure Type Anemometers.—For measuring air velocities much above 100 feet per minute that have definite and constant direction, the rotary vane anemometer (fig. 5) is convenient. It consists of a small windmill geared to a tachometer, which counts the number of revolutions and is calibrated to indicate directly the number of feet of air that have passed through the vanes over a measured period of time.

14. Yaglou, C. P.: The Heated Thermometer Anemometer, J. Indust. Hyg. & Toxicol., to be published.

The vane anemometer is used principally at the face of registers or grilles to determine the air velocity through the grilles and thereby the flow of air through the room. It is also extensively used for the measurement of air flow in mines and tunnels. This type of anemometer usually registers a velocity that is within 10 per cent above or below the true velocity, but if the instrument is not cleaned and calibrated frequently its error may be as high as 30 or 40 per cent.

Another instrument for the measurement of unidirectional air currents is the swinging vane direct-reading velocity meter of the type shown in figure 6. Air entering one side of the instrument impinges on a counterbalanced vane directly connected with the scale pointer and leaves through a port on the opposite side. The advantages of this type of velocity meter are that no observation of elapsed time is required, instantaneous readings are possible and usually no computations are necessary. Variable air velocities below 100 feet per minute cannot be determined accurately by this type of meter. For high velocity readings, special adapters, orifices or jets with rubber tube connections are attached to the air inlet and outlet ports, and the range of usefulness of the meter can be extended to the measurement of air velocities inside ventilating ducts.

There are several other types of air metering devices, such as pitot tubes, venturi tubes and orifice meters[11] that are commonly used by engineers for air flow measurements inside ventilating ducts, but these are outside the scope of this report.

Rate of Air Change in Rooms.—The rate of air change in confined spaces may be determined by measuring the air flow in the supply duct to the room or by measuring the concentration of carbon dioxide at different points in the breathing zone of an occupied room. The advantages of the second method are that

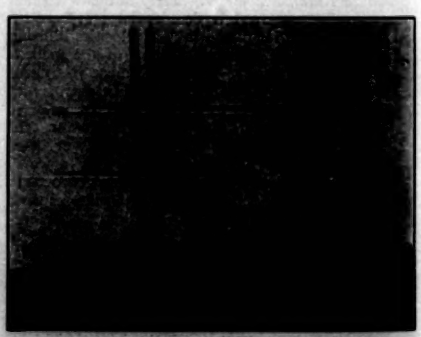

Fig. 4.—Heated thermometer anemometer. (Courtesy C. P. Yaglou.)

it also takes into account leakage of air through window and door openings, and it affords an estimation of the distribution of air to various parts of the room. Haldane's apparatus[15] or Petterson and Palmquist's apparatus is commonly used for measuring carbon dioxide concentrations. The amount of outdoor air supplied to the room in cubic feet per minute per occu-

15. Haldane, J. S., and Graham, J. L.: Methods of Air Analysis, London, Charles Griffin & Co., Ltd., 1935.

pant is computed from the following equation, assuming that each person produces 0.6 cubic foot of carbon dioxide per hour:

$$\text{C. F. M. per occupant} = \frac{100}{(CO_2)_r - (CO_2)_o}$$

Where $(CO_2)_r$ = average concentration of carbon dioxide in room in parts per 10,000 and $(CO_2)_o$ = concentration in outside air, usually assumed at 3 parts per 10,000

Wells[16] has recently described a bacteriologic method of determining air change in rooms by atomizing a dilute liquid culture of Bacillus coli into the air and determining the rate of disappearance of the bacilli by means of his centrifuge. The number of air changes per hour was found to be equal to the difference between the natural logarithms of the counts of two successive samples divided by the elapsed time in hours between the two samples.

RADIATION

All bodies are continuously radiating heat to one another, and those which remain at a constant temperature are receiving as much heat as they lose. Although heat transferred by radiation passes through the intervening air, it is, for practical purposes, independent of the physical properties of the atmosphere.

Radiation of heat between two objects is proportional to the difference between the fourth powers of their absolute surface temperatures (Stefan-Boltzman law) and also to the emissivity of the surface. A perfect "black body" has an emissivity of 1, while a highly polished metallic surface may have an emissivity as low as 0.02.

Occupants of a room are subjected to "positive" radiations from radiators or warm objects and "negative" radiations to cold windows or walls. The sum of all positive and negative radiations is usually expressed in terms of the "mean radiant temperature."

In crowded spaces such as classrooms, auditoriums and theaters, the heat lost by radiation from the bodies of occupants to the walls and surroundings is reduced considerably because of counter radiation between persons closely assembled. A lower air temperature, lower humidity or increased air movement may therefore be required to offset the decrease of heat loss by radiation under such conditions.

Radiation from any given source can be accurately estimated by directing a bolometer, radiometer or thermopile to receive the radiation from that source.

The bolometer offers a small absorbing surface of about 3 square inches of hard black enamel covering a coil of platinum wire around a thin mica plate. The change of electrical resistance of the coil on exposure to radiation is measured, and from this can be determined the intensity of the radiation per square foot per hour.[17]

The Crookes radiometer is an instrument for detecting and measuring radiant energy by converting it into the mechanical energy of a small rotating vane mounted in an evacuated glass bulb. Each blade of the vane presents a reflecting surface as it approaches the source of radiation and an absorbing surface as it travels away from the source.

The thermopile is a series of small thermocouples whose combined potential differences, indicated by a sensitive galvanometer, are a measure of the intensity of radiation striking the exposed ends of the thermocouples.

16. Wells, W. F., and Wells, M. W.: Measurement of Sanitary Ventilation, Am. J. Pub. Health 23: 343 (March) 1933.
17. Bone, W. A.; Callendar, H. L., and Yates, H. J.: A Bolometric Method of Determining the Efficiencies of Radiating Bodies, Proc. Roy. Soc. London, Series A 92: 243, 1915.

INSTRUMENTS COMBINING RADIATION-CONVECTION EFFECTS

Radiation meters such as the three just described are not suitable for frequent determinations of the mean radiant temperature because a great number of readings must be taken in order to integrate radiation from all directions. Moreover, these radiations must be suitably combined with the convectional cooling power of the air in order to estimate the relative warmth of different environments, excluding humidity effects. Various instruments have been devised especially for this purpose. Under ordinary conditions of warmth during the heating season when humidity is somewhat unimportant, the human body response to

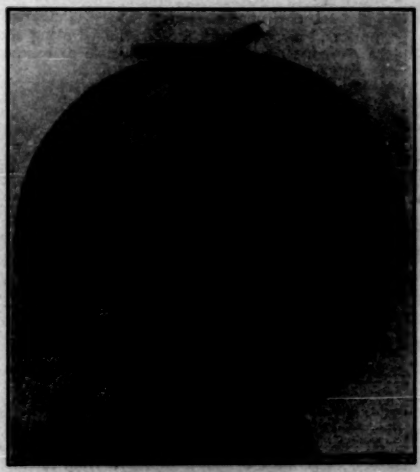

Fig. 5—Rotary vane anemometer (courtesy Taylor Instrument Companies).

environmental change is somewhat like a physical instrument, and sensations of warmth follow closely the indications of suitably designed radiation-convection meters. Outside the comfort zone, however, where definite physiologic reactions are manifested, all physical instruments fail to some degree because it is too difficult to simulate human response to heat and cold.

Unheated Globe Thermometer.—The unheated globe thermometer[18] is the simplest of all radiation-convection instruments that have been proposed as indicators of environmental warmth. It consists of a 6 inch blackened copper sphere containing an ordinary thermometer with its bulb at the center of the sphere. Owing to convection effects, its temperature reading usually lies between the air temperature and the mean radiant temperature of the surroundings and indicates only whether the mean radiant temperature is higher or lower than the air temperature. It is best suited

18. Vernon, H. M.: The Measurement of Radiant Heat in Relation to Human Comfort, J. Indust. Hyg. 14: 95 (March) 1932.

to rooms heated by radiant methods. In rooms heated by convection methods the surface temperature of the globe is far below the surface temperature of the human body. The instrument tends to underestimate negative radiations to cold walls and windows. In some cases the resulting globe temperatures may be misleading. For example, if wall temperatures are below the air temperature, the globe reading in "still" air will be lower than the air temperature; but if the air is set in motion, the globe thermometer will rise to approach the air temperature. Thus, in the latter case the globe thermometer indicates apparently warmer conditions when, in fact, the increase in air movement usually has just the opposite effect on the human body. When the walls and air are at the same temperature, the globe records the air temperature and is not at all affected by air movement.

As pointed out by Bedford and Warner,[19] the globe thermometer in itself is inadequate as an index of the thermal environment, but if the dry-bulb temperature and air movement are determined along with globe thermometer readings it is possible to compute

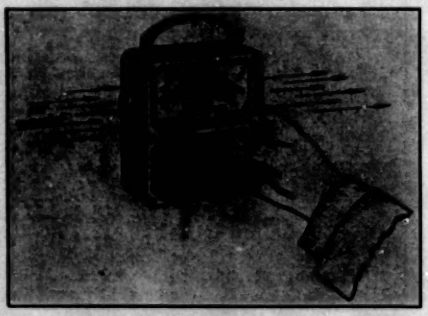

Fig. 6.—Swinging vane direct-reading air velocity meter (Velometer—courtesy Illinois Testing Laboratories, Inc.).

either the "equivalent temperature" or the mean radiant temperature of the environment from equations developed by these investigators.[20] The equivalent temperature of a thermally nonuniform environment is defined as the temperature of a thermally uniform enclosure (walls, furnishings and air at the same temperature) in which, under still air conditions, a "sizable" black body loses heat at the same rate as in the nonuniform environment. This is a very useful quantity in air conditioning, as it combines mean radiant temperature and air temperature into a single value.

Heated Globe Thermometer.—Some of the drawbacks of the unheated globe may be overcome by heating it so as to make its rate of heat loss by radiation and convection per unit surface area comparable to that of the human body. Yaglou[21] constructed such a heated globe using two or three hollow concentric spheres for equalizing the outside surface temperature of the instrument. The outer sphere is 6 inches in diameter and painted a dull black; the inner sphere is 4 inches in diameter and contains an electrical heating element which is normally adjusted to produce a heat loss of 15.3 British thermal units per hour per square foot of surface of the outer globe. This is the rate of heat loss by radiation and convection in an average adult under usual sedentary conditions. An ordinary glass thermometer with its bulb adjacent to the inside of the outer globe gives the instrumental reading with little time lag. The readings of such a globe seem to correlate well with the sensations of warmth and comfort induced by various environmental conditions, and such readings can be utilized in computing equivalent temperature or mean radiant temperature of the environment.

Thermo-Integrator. — Winslow and Greenburg's "thermo-integrator"[22] operates on the same principle as the heated globe except that instead of an ordinary thermometer it utilizes thermocouples for measuring the mean temperature of the surface from which heat loss takes place.

The instrument consists of a blackened hollow cylinder 8 inches in diameter and 24 inches high with hemispherical ends. The cylinder is evacuated to less than 0.1 per cent of atmospheric pressure to minimize convection currents and air stratification within the instrument and thereby maintain a more uniform surface temperature. A nichrome wire filament inside the cylinder furnishes heat at the rate of 17.5 British thermal units per square foot per hour. Eight thermocouples distributed over the surface of the instrument are arranged in a parallel circuit and connected to an automatic recorder so as to obtain a continuous record of the average surface temperature.

Eupatheoscope.—Dufton's eupatheoscope[23] is essentially a cylinder 7½ inches in diameter and 22 inches high, which is heated from the inside by electrical elements. Preliminary studies indicated that a body of this size was necessary to imitate faithfully the responses of the human body to the effects of radiation. The current input to the elements is measured and controlled to maintain the cylinder surface temperature at 75 F.,[24] as indicated by several suitably distributed thermocouples embedded in the surface. The equivalent temperature is determined from the heat input necessary to maintain the cylinder at 75 F. This particular instrument cannot be used at temperatures above 75 F.

The principle of operation of the eupatheoscope is the reverse of that of the thermo-integrator and the heated globe. Instead of constant heat production and variable surface temperature as is practically the case in the human body, the eupatheoscope functions with variable heat input and approximately constant surface temperature. Lately Dufton[25] reconstructed his instrument providing for a variable surface temperature in accordance with studies made by Bedford on a large number of persons. Details of the new eupatheoscope are not as yet available, but it is hoped that it will afford a more representative index of human response and that its useful operation will be extended to temperatures above 75 F.

19. Bedford, T., and Warner, C. G.: The Globe Thermometer in Studies of Heating and Ventilation, J. Hyg. 34:458 (Dec.) 1934.

20. Bedford, T.: The Measurement of Environmental Warmth, Tr. Inst. Mining Engrs. 94:76, part 1, 1937-1938.

21. Yaglou, C. P.: A Heated Globe Thermometer for Evaluating Environmental Conditions of Comfort and for Studying Radiation-Convection Effects, J. Indust. Hyg. 27:185 (Sept.) 1935.

22. Winslow, C.-E. A., and Greenburg, L.: The Thermo-Integrator—A New Instrument for the Observation of Thermal Interchanges, Heating, Piping & Air Conditioning 7:41 (Jan.) 1935. Winslow, C.-E. A.; Gagge, A. P.; Greenburg, L.; Moriyama, I. M., and Rohles, F. J.: The Calibration of the Thermo-Integrator, Am. J. Hyg. 29B:137 (Jan.) 1939.

23. Dufton, A. F.: The Equivalent Temperature of a Room and Its Measurement, British Department of Scientific Research, Building Research Bull. 13, London, H. M. Stationery Office, 1932.

24. This is supposed to be the mean surface temperature of a person at rest under comfortable conditions in England.

25. Dufton, A. F.: The Equivalent Temperature of a Warmed Room, J. Inst. Heat. & Vent. Engrs. (London) 6:227, 1936.

The eupatheoscope is a valuable laboratory instrument, but it is expensive and too cumbersome for field determinations of the equivalent temperature. For this purpose Dufton [26] has suggested the use of two katathermometers, one with a silvered bulb and the other with a blackened bulb, both having a cooling range of from 75.5 to 74.5 F. The time of cooling of these special katathermometers is recorded on a special stop watch. These two readings added together give approximately the equivalent temperature of the environment.

In the original work in England a room was assumed to be comfortably warmed when the eupatheoscope lost heat at the rate of 17.5 British thermal units per hour per square foot of external surface. The surface temperature of the instrument was maintained at 75 F. In the United States, where convection type of heating rather than radiant heating is used, where clothing is lighter and indoor air temperatures are kept higher, Willard and others [27] have used 15.4 British thermal units per hour per square foot with the surface temperature at 83 F. (the accepted mean surface temperature of the human body in this country at the comfortable temperature of 73 F.) as the standard of comfort to be indicated by the eupatheoscope.

RADIATION DURING THE HEATING SEASON

Under ordinary living and working conditions in this country the extent of radiation encountered is not great except under unusual conditions. In an unpublished study Yaglou found that in ordinary frame or masonry dwellings and office buildings heated to from 69 to 75 F. by hot water or steam the radiation effect was approximately equivalent to from —1.6 to +2 degrees F. in dry-bulb temperature on the unheated globe and from —2.1 to +2.5 degrees F. on the heated globe. These readings were made in the center of the rooms 3 feet above the floor, and the air movement in all instances was less than 40 feet per minute. The rooms had from one to three exposures and the outdoor temperatures during the observations were between 6 and 35 F.

Other readings taken 6 inches from a single-glass window on a cloudy day when the outside temperature was 21 F. showed a cooling effect equivalent to 2.6 degrees F. on the unheated globe and 4.2 degrees F. on the heated globe. Under approximately identical conditions but with the sun shining through the glass the maximum heating effect was approximately equivalent to 34 F. on both globes.

An ordinary thermometer exposed to the same conditions showed a temperature only about 9 degrees F. above air temperature.

Vernon [28] reported a similar experience in British factories and homes. The extent of radiation ordinarily experienced there was on the order of + or —1.5 degrees F. on the unheated globe, except in front of furnaces or gas or coal fires, which raised the globe thermometer reading as much as 75 degrees F. above air temperature.

THE EFFECTIVE TEMPERATURE INDEX OF WARMTH

The term "effective temperature" [29] is a misnomer because the entity itself is not a "temperature" but a composite index of the degree of warmth resulting from exposure to different combinations of air temperature, humidity and air movement. A more fitting term would be "warmth index." This index was experimentally determined from the subjective sensations of trained men who compared not the relative comfort but the relative warmth of various air conditions in two adjoining rooms by passing alternately from one room to the other. It comprises two different scales: the "basic" [29a] for men stripped to the waist, and the "normal" [29c] for men normally clothed (fig. 7).

Air conditions having the same effective temperature index are not necessarily equally comfortable, since warmth is not the only criterion of comfort. High humidity may create discomfort from damp skin and clothing; low humidity may dry up the skin, eyes or nasal passages. Excessive air movement may be annoying although it may not be actually chilling. Radiation, which is not included in the effective temperature index, not only affects the warmth sensation but may also be responsible for the decided discomfort brought about by simultaneous sensations of heat and cold when different parts of the body are exposed to surrounding surfaces whose temperatures are much above or below that of the body. However, until a better index is introduced, the effective temperature probably will remain the best single index of warmth and the physiologic reactions induced by excessive heat or cold, including humidity effects.

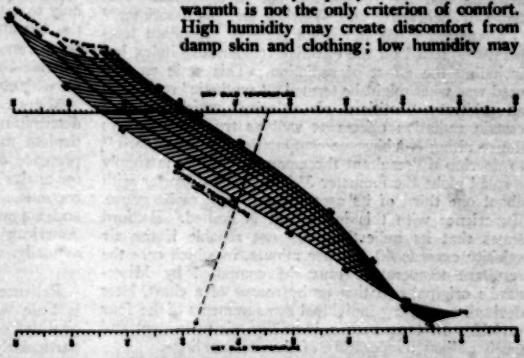

Fig. 7.—Normal scale of effective temperature applicable to inhabitants of the United States wearing customary clothing, at rest or doing light physical work, and in rooms heated by convection methods (Yaglou, C. P., and others: How to Use the Effective Temperature Index and Comfort Charts, Heating, Piping & Air Conditioning 4:433 [June] 1932).

By definition, the effective temperature index of any given combination of air temperature, humidity and air movement is numerically the same as the temperature of still air (velocity under 25 feet per minute) satu-

26. Dufton, A. F.: The Use of Katathermometers for the Measurement of Equivalent Temperature, J. Hyg. 32:349 (Aug.) and 474 (Nov.) 1932.

27. Willard, A. C.; Krutz, A. F., and Fahnestock, M. K.: The Application of the Eupatheoscope for Measuring the Performance of Direct Radiators and Convectors in Terms of Equivalent Temperature, Heating, Piping & Air Conditioning 5:369 (July) 1933.

28. Vernon, H. M.: The Radiation Experienced in Factories and Houses, J. Indust. Hyg. & Toxicol. 19:490 (Nov.) 1937.

29. (a) Houghten, F. C., and Yaglou, C. P.: Determining Lines of Equal Comfort, Tr. Am. Soc. Heat. & Vent. Engrs. 29:163, 1923; (b) Cooling Effect on Human Beings Produced by Various Air Velocities, ibid. 30:193, 1924. (c) Yaglou, C. P., and Miller, W. E.: Effective Temperature with Clothing, ibid. 31:89, 1925. (d) Houghten, F. C.; Teague, W. W., and Miller, W. E.: Effective Temperature for Persons Lightly Clothed and Working in Still Air, ibid. 32:315, 1926.

rated with moisture (100 per cent relative humidity) that will induce the same sensation of warmth as the given air condition. The effective temperature index cannot be measured directly by physical instruments except within a limited range. It is determined from readings of the dry-bulb and wet-bulb thermometers and the velocity of air movement by the use of empirically constructed tables or charts (fig. 7).

The effective temperature index is extensively used in this country, while in England the katathermometer had been in wide use as an index of warmth until it was recently superseded by the eupatheoscope and Vernon's globe thermometer.

One disadvantage of the effective temperature index is that it does not fully allow for radiation effects, since it was determined in rooms heated by convection methods with walls and air at approximately the same temperature. Houghten and McDermott [30] attempted to derive correction factors for negative radiation to cold walls, but their experimental conditions were too artificial and the results are not in agreement with those of Bedford [31] and Winslow and his associates.[32]

Missenard [33] has devised a scale of "resultant temperature" based on the effective temperature index but including the effect of radiation. This scale as first used was what might be termed a "synthetic" scale with an arbitrary "fictitious air velocity" which included certain radiation effects as well as true air velocity; the resulting troublesome computations led Missenard [34] to develop a "resultant thermometer," which is simply a small globe thermometer 3½ inches in diameter with about one third of its area covered with moist gauze. Experience with this instrument is limited. Bedford states that its indications are not reliable if the air velocity exceeds 40 feet per minute, in which case the resultant temperature must be computed by Missenard's original equation or by means of a chart, later devised, combining individual measurements of the four variables air temperature, humidity, air movement and mean radiant temperature of the surroundings.

A provisional scale of "equivalent warmth" has been constructed and presented in the form of an alinement chart by Bedford [35] which is designed to make allowance for radiation effects but is similar to the effective temperature scale developed in this country in that the standard or reference conditions are those of a thermally uniform enclosure in which the air and surroundings are at the same temperature and in which the air is saturated with moisture and is "perfectly still."

BAROMETRIC PRESSURE

The pressure of the atmosphere is not, of itself, an important consideration in ordinary air conditioning. Under abnormal conditions of air pressure special problems do arise such as illness due to compressed air in caisson work and deep sea diving, or symptoms of oxygen deficiency at high altitudes and in airplanes without airtight cabins, but discussion of such problems is not required in the present report.

Indirectly, barometric pressure may become important through its effect on temperature and humidity as, for example, in underground work at depths of several thousand feet. As one descends the shaft of a deep mine it is usually noted that the air temperature, and in some cases the content of moisture of the air, gradually increases. The temperature increase is due largely to autocompression of the air and to the geothermal gradient of rocks. In the presence of water, part of this heat is consumed in evaporating moisture and the amounts of heat and moisture present set the limit of depth for economic underground operations.

Instruments for measuring barometric pressure are well known and require no discussion here.

ATMOSPHERIC CONTAMINATION

Where indicated, instrumental determinations may be made of air purity with regard to dusts, fumes, vapors, gases, bacteria, pollen or offensive odors not only to discover the nature and quantity of the impurities but also to aid in the selection of an effective and specific method of eliminating undesirable contaminants, whether by direct removal or by displacing the impure air with clean air.

Many types of instruments have been developed for determining the quantity, size and composition of particulate matter in the atmosphere, for detecting the presence of toxic or combustible gases or vapors, or for analyzing the air for its oxygen and carbon dioxide contents. A general discussion of suitable methods and apparatus will be found in the yearbook of the American Public Health Association, which is revised annually.

COMMENT AND SUMMARY

Reliance on ordinary dry-bulb thermometer readings is little warranted as an index of comfort-providing qualities of the air. The use of other instruments is particularly desirable in connection with artificial atmospheres subject to some degree of variation. No single instrument at this time adequately records the thermal quality of the environment combining the four principal factors, namely air temperature, humidity, air movement and radiation. A fair degree of success has attended the development of instruments for combining radiation and convection effects during the heating season, but considerable difficulty has been experienced in attempts to extend the range of these measurements to summer conditions. This difficulty obviously is due to complex physiologic reactions whereby cutaneous blood circulation, rate of perspiration and extent of wetted body surfaces are altered by the body in self defense on exposure to warm conditions. No physical meter can be expected fully to simulate these delicate responses. At the present time "effective temperature" probably is the best index of environmental warmth available. Effective temperature adequately serves with respect to high temperatures and humidities, but since it does not embrace radiation effects its usefulness in determining winter comfort is restricted.

This report, which includes descriptions of many instruments and indexes designed for the measurement or evaluation of air conditions, advocates the use of each instrument or index under those environmental conditions for which it is best adapted.

10 Peterboro Street.

30. Houghten, F. C., and McDermott, P.: Cold Walls and Their Relation to the Feeling of Warmth, Heating, Piping & Air Conditioning 5: 53 (Jan.) 1933.
31. Bedford, T.: The Warmth Factor in Comfort at Work, Report 76, Brit. Indust. Health Res. Board, London, H. M. Stationery Office, 1936.
32. Herrington, L. P.; Winslow, C.-E. A., and Gagge, A. P.: The Relative Influence of Radiation and Convection upon Vasomotor Temperature Regulation, Am. J. Physiol. 120: 133 (Sept.) 1937.
33. Missenard, F. A.: Étude physiologique et technique de la ventilation, Paris, Librairie de l'enseignement technique, 1934.
34. Missenard, F. A.: Theorie simplifiée du thermomètre résultant: Thermostat résultant, Chauffage et ventilation 12: 347, 1935. Bedford, T.: Requirements for Satisfactory Ventilation and Heating, The Human Factor, J. Nat. Inst. Indust. Psychol., London 10: 245 (July-Aug.) 1936.
35. Bedford, T.: Warmth and Comfort, J. Inst. Heat & Vent. Engrs. 4: 383 (Nov.) 1936; footnote 31.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

DENVER RADIOACTIVE PRODUCTS NOT ACCEPTABLE

Manufacturer: Denver Radium Service Laboratories, Majestic Building, Denver.

The Denver Radium Service Laboratories have submitted for consideration by the Council several products containing radium or radon. These products include:

1. One radium emanation jar, called "the vitalizer."

2. Two ampules of radium chloride solution for intravenous injection said to contain from 2 to 50 micrograms of radium chloride 98 per cent pure, in isotonic solution.

3. One ounce of sterile saline solution containing 10 micrograms of radium chloride, for oral administration.

4. One bottle containing 100 tablets, each tablet claimed to contain approximately 10 micrograms of radium chloride with sugar milk base, for oral administration ("Chloradium solution tablets").

5. One bottle (containing 100 tablets) of so-called endocrine compound No. 1 (for male). These tablets are claimed to contain 1/50 gram of anterior pituitary, 1/4 gram of suprarenal cortex, 1/50 gram of thyroid, 1/2 gram orchic, sugar milk and starch binder. Each tablet is also claimed to contain 1/10 microgram of radium chloride.

6. One bottle (containing 100 tablets) of endocrine extract No. 2 (female). Each tablet is said to contain 1/50 gram of anterior pituitary, 1/4 gram of suprarenal cortex, 1/50 gram of thyroid, 1/2 gram of ovarian, sugar milk and starch binder and flavoring. Each tablet is also claimed to contain 1/10 microgram of radium chloride.

7. One carton of so-called emanation bath (quantity perhaps 2 ounces, but unspecified) and said to contain epsom salt, sodium chloride and 1 microgram of radium chloride.

8. One tube (quantity unspecified) of vaginal jelly, claimed to contain glycerin, gum tragacanth base, lactic acid, quinine hydrochloride, boric acid resorcinol, and 1/10 microgram of radium chloride per ounce.

9. One carton of so-called vaginal douche (quantity unspecified, but about 2 ounces) claimed to contain alum, menthol, sodium chloride, sodium bicarbonate, tannic acid and epsom salt. The quantity of radium chloride, if any, is not mentioned.

10. One carton of so-called colonic irrigation (rectal) claimed to contain sodium chloride, tannic acid and castile soap. The quantity of radium chloride, if any, is not specified.

11. One bottle (1/2 ounce) of ophthalmic solution claimed to be a saline solution containing 1/2 gram of ephedrine hydrochloride and 1/2 microgram of radium chloride.

12. One box of urethral bougies (twelve) claimed to contain glycerin, triple distilled water, cocoa butter, gelatin, boric acid, europhan, thymol iodide, sulfonal, and 1/10 microgram of radium chloride.

13. One box (twelve) of vaginal suppositories ("Chloradium suppositories") claimed to contain cocoa butter base, lactic acid, boric acid, resorcinol, zinc iodide and 1/10 microgram of radium chloride.

14. One box (twelve) of suppositories. This box, which is plainly labeled "rectal," does not contain rectal suppositories but contains what are undoubtedly vaginal ampules made of stiff gelatin, and possibly correspond to the item listed as special vaginal ampules containing gelatin, glycerin, alaterium (?), calcium chloride and 1/10 microgram of radium chloride.

15. (*a*) One box containing twelve rectal suppositories wrapped in tinfoil.

(*b*) One box containing twelve rectal suppositories wrapped in tinfoil.

These two boxes have no outside description to indicate what the suppositories in the two boxes are made of. In the list furnished by the Denver Radium Service these suppositories are claimed to contain cocoa butter (base), boric acid, anesthesin, ephedrine hydrochloride and Canada balsam; also each suppository is claimed to contain 1/10 microgram of radium chloride.

16. One jar (quantity unspecified) of ointment designated as "Narada Balm" and claimed to contain a neutral base, camphor, menthol, 1 gram of eucalyptol oil and 10 micrograms of radium chloride per pound.

17. One jar (quantity unspecified) of chloradium ointment. This is an ointment which, the Denver Radium Service states, can be prepared in any strength of radium chloride from 2 to 50 micrograms per ounce. The charge of 20 cents per microgram for additional radium chloride is made. This ointment is also prepared in tubes with applicator or in opal or glass jars.

The active agent in these products is claimed by the Denver Radium Service to be "Radium" and "the therapeutic value of radium is due to its radioactivity." In the booklet "Therapeutic Use of Radium Emanation Preparations," the firm states that "Radium Emanation is not a drug in the common meaning but a physical agent. It forms no chemical compounds in the body." Since these products are said to be in the category of physical agents, the Council on Physical Therapy has given consideration to them.

Item 1. The "Radium Vitalizer Generator" consists of a chinaware jar 2 1/4 inches in diameter and 5 1/2 inches tall with a small perforated projection at the upper end whereby the vitalizer may be suspended. The middle two thirds of this jar is characterized by multiple perforations about one-eighth inch in diameter arranged in vertical as well as horizontal rows all around the jar. In the bottom of the jar is an opening filled with wax. This opening apparently is the only means of entrance to the interior of the jar, in which is housed a hollow container the nature of which cannot be made out without removing the seal. This container, however, is also perforated and contains fragments of some material made up of irregular pieces of chalk-like substance. In a separate box came a piece of chalk-like material measuring 4.9 by 1.4 by 1 cm. This particular item was not listed in any of the lists prepared and submitted by the Denver Radium Service Laboratories. The method of using the vitalizer is described in a circular. Apparently the vitalizer comes in two forms, a large form for office, hotel or home, and the smaller form for use while one is traveling. This device is described as "a scientifically prepared general purpose device, designed to generate Radium-Emanation in drinking water with distinct therapeutic value." In another paragraph is found the following statement in double face type: "We guarantee the Radium-Active Vitalizer Generating Unit to come within the present requirements of the American Medical Association as to Radium Emanation yield." Another statement is the following: "The Radium-Active Vitalizer is the result of extensive research on the part of the personnel of the Denver Radium Service Laboratories, and other radium authorities who were associated." The method of using the vitalizer is described as follows: "Place the unit in the jar and fill with water. Allow to stand about two hours in order to thoroughly cleanse the unit. Refill the vessel (contents 6 quarts) and allow to stand from 12 to 24 hours in order to become thoroughly activated. Then drink the water as desired, average quantity being 6 to 8 glasses per day. Replace the water consumed during the day, and thus a continuous supply of Radioactive water is assured."

From the foregoing, therefore, the unit within the jar contains the radioactive substance designed to impregnate the water with radium emanation. Tests showed very slight radioactivity when the generator was soaked in 200 cc. of water for forty hours and 60 cc. of this water was used for the determination. Measurements of the radioactivity of the contents of the jar as well as of the separate cake of chalk-like material are given in the accompanying table.

A reliable investigator tested the radioactivity of these products with the following instruments:

(*a*) *Electroscope.*—An aluminum leaf electroscope connected to an ionization chamber of approximately 300 cc. volume was used. The preparation being tested was placed on top of the ionization chamber and the time of fall of the leaf over a definite part of the scale was determined. The radium content of the

preparation was determined by comparing the rate of fall of the leaf produced by the preparation with the rate of fall produced by the standard after both rates had been corrected for the natural leak of the instrument. A determination was made of the natural leak at least once, the rate for the standard generally twice, and the rate for two or three of the preparations during each half day when measurements were made. The top of the ionization chamber was a piece of aluminum 5 mm. thick which would absorb practically all of the beta radiation. The results may be duplicated with this instrument to within ± 5 per cent.

(*b*) *Geiger Counter.*—A Cenco Impulse counter was used which would respond to gamma rays but to very few beta particles. The distance of the preparations and the standard from the counter during the tests was varied according to the strength of the preparation so that the number of discharges would be markedly greater than the blank reading (owing to cosmic radiation and unknown radioactive sources) and not too great for accurate counting. A blank reading, a reading for the standard and readings for from one to three of the preparations for one minute each were taken successively until a total of ten readings for each had been made, the results of which may be duplicated with this instrument to within ± 15 per cent.

Measurements on Radioactive Material from Denver Radium Service

No.	Description	Micrograms of Radium Claimed	Micrograms of Radium Measured: Electroscope	Micrograms of Radium Measured: Geiger Counter
1-A	Radium Vitalizer	25*	7.5	12.3
1-B	Radium Vitalizer sealed in a beaker containing 300 cc. distilled water for 115 hrs. Following tests made on 130 cc. of this water sealed in a flask			
	4 hours after removal from Vitalizer	..	1.2	2.6
	26 hours after removal from Vitalizer	..	1.1	...
	52 hours after removal from Vitalizer	..	0.9	1.6
2-A	Ampule of Ra Cl_2 intravenous solution	20	22.2	23.5
2-B	Ampule of Ra Cl_2 intravenous solution	40	39.2	38.7
6	White Brick, 5 by 1.5 by 0.6 cm.	10	7.3	8.5
4	1 ounce bottle of Internal Solution	10	5.2	6.2
12	Small bottle of Ophthalmic Solution	0.5*	0.6	0.5
8	Bottle of 100 Endocrine Compound No. 1 tablets	10	1.2	1.5
7	Bottle of 100 Endocrine Compound No. 2 tablets	10	4.3	6.2
5	Bottle of 100 Internal Solution Tablets	10	6.0	6.5
3	12 Vaginal Suppositories	1.2*	2.3	3.0
9	12 Vaginal Suppositories	1.2*	0.1	0.6
10	12 Vaginal or Rectal Suppositories	1.2*	0.7	1.1
11	12 Rectal Suppositories	1.2*	0.5	1.5
13	2 Urethral Bougies	1.5*	1.2	1.9
14	1 Tube of Vaginal Jelly	0.15*	0.5	1.6
15	1 Jar of Surgical Dressing	5*	0.3	0.9
19	1 Jar of Balm	5*	0.5	1.3
16	1 Carton of Bath Salts	1*	0.3	1.2
17	1 Carton of Vaginal Douche Salts	?	0.3	0.7
18	1 Carton of Colonic Irrigation Salts	?	0.1	Trace

* Value obtained from letters or literature and may or may not apply to preparations supplied. In some cases it is not clear whether radium content applies to a single piece or to box; in others radium content is given for an amount of the substance but the amount in the container is not stated. Some preparations are said to be prepared with any amount of radium.

For a standard of radioactivity a 2 cc. ampule of radium chloride solution, containing approximately 10 micrograms of radium, was used. The accuracy of the solution does not differ from 10 micrograms more than a few per cent. The results are given in the table.

Advertising Material.—The advertising material submitted to the Council with the foregoing items consisted of a pamphlet entitled "Radium Therapeutics and methods of administration for the general practitioner" and eighteen circulars, three of which refer to the use of the radioactive waters in general and the use of the Vitalizer Generator in particular. One of these is a small pamphlet entitled "Radioactive Waters Past and Present." Another contains a description of the Vitalizer Generator and a third circular is a reprint of a sort of list of the natural sources of radioactivity in natural waters, reprinted from the *Rocky Mountain Druggist*, entitled "Radioactive Waters Past and Present, Extracts from Government Bulletin and Remarks from Authorities." The other circulars refer to the various other preparations prepared and distributed by the Denver Radium Service Laboratories.

One circular entitled "Do you Suffer with . . . Glandular weakness, general debility, muscular exhaustion, irritability, extreme nervousness, loss of weight, insomnia, despondency, stomach and intestinal disorders, chronic constipation, no ambition, poor vital forces" was presented. Then, apparently because this list is not complete enough, a little lower the word "neurasthenia" is brought in. The circular is worded in such a way that the reader is led to believe that any one suffering from any of the conditions mentioned can have these difficulties removed by using "Radiotone Tablets," the radium tablet apparently corresponding to the endocrine tablets listed at the beginning of this report. Stress is laid on the fact that Radiotone Tablets "contain all the different important gland substances and enzymes, in addition to the radium" which is to supply the vitalizing urge. The second circular is headed "Narada Radium Preparations—Why Suffer?" "Used successfully in the treatment of such conditions as rheumatism, neuralgia, arthritis, neuritis, anemia, high blood pressure, gout, neurasthenia, prostatitis, nervous trouble, vaginal trouble, hemorrhoids, and piles."

In a separate one page leaflet entitled "Does Radioactivity Really Benefit? Study this Chart and See" there is given a long list of physical disorders beginning with old age, anemia and asthma and ending with polyarthritis, rheumatism, sciatica and tabes dorsalis, the entire list comprising thirty-one states of physical disintegration, and against each one is given a number of cases supposed to be cured or benefited, as well as a final column containing the supposed number of cases not benefited by treatment with radioactive substances which are not specified, but the impression is given that the treatment was with the Vitalizer Radium Water Jar. Of 111 cases of anemia, for example, seventy-one cases were supposed to have been cured and forty benefited; of 1,291 cases of arthritis, 906 are listed as cured, 219 as benefited and 166 as not benefited. Of 197 cases of chronic metritis, no cases are included in the column of cured cases, 127 in the column of cases benefited and seventy among the cases not benefited. This list is said to have been compiled by Dr. Sigmund Saubermann of Berlin, Germany.

In the case of the products of the Denver Radium Service Laboratories, the amount of radioactive substance contained in any of them is so small that the use of these preparations would probably do no harm, but for the same reason they could not be expected to do any good. If they should be used in larger doses or if their use should be continued for a long time, the possibility of danger cannot be avoided. As the result of repeated experiments on animals as well as clinical observation in human beings, it is now well known that the internal administration of radium or products of radium in certain doses can produce damage to the tissues. When taken by mouth, in excessive doses, these substances are excreted chiefly through the intestine and through the kidneys. Because these substances do not stay long enough in the small intestine they do not produce any lesions there, but in the large intestine, where they stay for a longer time, they produce a hemorrhagic form of inflammation characterized by multiple discrete or massively coalescing petechial hemorrhages, with desquamation, edema and the like. In the kidneys they produce, first, degeneration of the epithelium of the convoluted tubules, followed by edema and more or less intense reactive inflammation.

When substances of this kind are injected intravenously in sufficient doses, not only do the large intestine and the kidneys show lesions similar to those described but corresponding lesions of the liver have been repeatedly described as having occurred in experimental animals.

All of this, therefore, can be summed up briefly as follows: If these substances are used in moderate doses, they can probably do no harm but could also do no good. Considering these points, as well as the character of the advertising literature submitted, the Council cannot very well take any other action than to reject all these preparations as well as all the claims made for them and to make such rejection known to the medical profession.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL RECENTLY CONSIDERED THE REPORT OF THE REFEREE FOR SULFUR PREPARATIONS ON THE SUBJECT OF COLLOIDAL SULFUR IN THE TREATMENT OF ARTHRITIS. THE REFEREE EXPRESSED THE OPINION THAT NO FORM OF SULFUR SHOULD BE ACCEPTED BY THE COUNCIL FOR THE TREATMENT OF ARTHRITIS UNTIL THERE IS SATISFACTORY EVIDENCE OF ITS USEFULNESS. HE POINTED OUT THAT SATISFACTORY EVIDENCE REQUIRES CONSIDERATION OF THE FOLLOWING FACTORS: THE USE WITH SUFFICIENT CONTROLS AND FOLLOW-UP PERIODS OF OBSERVATION TO RULE OUT SO-CALLED SPONTANEOUS REMISSIONS; THE DETERMINATION OF THE TYPES OF CASES IN WHICH IT MAY BE USED WITH A FAIR EXPECTATION OF BENEFIT; THE DETERMINATION OF THE CHIEF CONTRAINDICATIONS; THE DETERMINATION OF THE OPTIMUM DOSAGE; THE DETERMINATION OF THE BEST FORM IN WHICH SULFUR IS TO BE USED, WHETHER AS FOOD RICH IN SULFUR, AS ORDINARY SULFUR ADMINISTERED ORALLY, OR AS COLLOIDAL SULFUR FOR INTRAMUSCULAR OR INTRAVENOUS INJECTION.

THE COUNCIL CONCURRED IN THE REFEREE'S CONCLUSIONS AND VOTED TO ACCEPT NO FORM OF SULFUR FOR THE TREATMENT OF ARTHRITIS UNLESS OR UNTIL THE CONDITIONS OUTLINED HAVE BEEN FULFILLED, AND AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

COLLOIDAL SULFUR IN THE TREATMENT OF CHRONIC ARTHRITIS

Osteo-arthritis is the most ancient disease of which there is a record, according to Dr. Joseph L. Miller[1] (1936), who states, however, that not one instance of rheumatoid arthritis of the extremities was noted during the examination of 35,000 Egyptian mummies. Today chronic arthritis and related conditions cause more frequent, intense and lasting pain than any other disease of humanity. Formerly the despair of physicians, it is now studied intensively in clinics at New York, Chicago, Philadelphia, Boston, Rochester (Minn.), New Haven (Conn.), Cleveland, St. Louis, Ann Arbor (Mich.), San Francisco, Tucson (Ariz.) and elsewhere, and progress is being made in the treatment of this condition.

A recent survey made in Massachusetts indicates that there are more than 3,600,000 sufferers from chronic rheumatism[2] in the United States but that the prevalence varies widely in different regions.

In spite of the enormous numbers of sufferers from arthritis, and its economic importance, there are few conditions which present so many medical problems and concerning which there is such diversity of opinion, especially with reference to therapeutic measures. Attention is often directed primarily to the joints affected, but Pemberton[3] (1930) states that atrophic arthritis is a systemic disease and that it is no more a disease of the joints [alone] than typhoid fever is a disease of Peyer's patches. The date of each paper cited is given because the present value of a contribution depends much on the date in this rapidly changing subject.

Sulfur has been used in a host of conditions for centuries and it is natural that it has been used in arthritis. H. E. Miller[4] (1935) states that colloidal sulfur was first prepared by Debus in 1888. Bory[5] (1907) and Fleig[6] (1907) injected it in a variety of conditions, including tuberculosis and syphilis, but their papers do not require further consideration here.

Cawadias[7] (1917) injected colloidal sulfur intravenously and intramuscularly in subacute rheumatism, in which he claimed that it caused the rapid and complete cessation of pain, retrocession of deformities and restoration of joint functions; the therapeutic effects being alike in the two methods of administration, but the intramuscular injection was not followed by such severe reactions as those after intravenous injection. Patients suffering with subacute and chronic rheumatism lost much incompletely oxidized sulfur.

Comrie[8] (1917) discussed "trench rheumatism" and allied conditions and stated that the intramuscular injection of colloidal sulfur, combined with rest and massage, was of the greatest value in subacute painful conditions in muscle and joints; that it was helpful in lingering gonorrheal rheumatism, but that it does not replace salicylates in acute articular rheumatism.

Meyer-Bisch and Basch[9] (1921) reported that the parenteral administration of sulfur caused increased destruction of albumin with an increase of the sulfur and nitrogen of the urine, the amount of sulfur excreted being much greater than that injected, and that the sodium chloride of the urine was increased transiently, while it, with water, was decreased after two days, at which time there were urobilinuria and glycuronuria. They reported a great difference between the effects of the oral administration of sulfur and that administered parenterally and stated that their results do not explain the clinical effects of the sulfur injected.

Heubner and Meyer-Bisch[10] (1921) reported that after the injection of sulfur in arthritis the sulfate esters of the serum were increased in the stage of fever and that the joint exudates yielded slightly more of these esters than the blood plasma and much more than in two other pathologic exudates, showing that these esters originate only in part from the circulation directly, partly from the walls of the joints. They concluded that this furnishes a basis for the curative value of sulfur in arthritis. Meyer-Bisch[11] (1921, 1922) published two papers under the same title: "Ueber die Behandlung chronisch deformierender Gelenkerkrankungen mit Schwefel." He stated that with the onset of fever there was usually less pain in the joints and increased motility. He reported only a few cases, and his paper is of little value now, though his work and that of his associates gave an impetus to the use of sulfur in arthritis.

Rohde[12] (1922), impressed with the work of Meyer-Bisch, also reported favorable results in the treatment of five cases of chronic joint rheumatism with injections of sulfur. There were severe reactions with headache and fever, but so great was the relief that he felt justified in continuing the treatment.

Reimann and Pucher[13] (1924) expressed doubt that sulfur has any specific action in arthritis deformans, since only those who showed no organic obstruction to joint movements were affected favorably by it. They observed effects very similar to those induced by the injection of nonspecific proteins, and they stated that milk, vaccines and other proteins induce less severe reactions than does sulfur. The intramuscular injection of sulfur in large doses sometimes causes necrosis and acute inflammatory exudate extending far beyond the seat of injection. They tabulated the results in seventeen cases, of which only four showed marked improvement, while nine either failed to improve or were made worse. They were unable to confirm the chemical data of Meyer-Bisch and imply doubt whether the patients of Meyer-Bisch who improved had arthritis deformans.

Vogel[14] (1924) reported a case of sulfhemoglobinemia due to the ingestion of sulfur while the patient was exposed to the action of paraminophenol made by the electrolysis of nitrobenzene. Nitto[15] (1934) observed severe symptoms, including vomiting and diarrhea, in three patients following the percutaneous inunction of purethan (an organic sulfur compound in olive oil for the treatment of scabies). In one of the patients the temperature reached 39.7 C. (97.5 F.), with slight edema about the eyes. The importance of these two reports of toxic actions is due to the fact that the literature contains little regarding the contraindications to the use of colloidal sulfur. One author goes so far as to state that there are no contraindications.

Cawadias[16] (1925) stated that patients suffering with rheumatoid arthritis excrete twice as much sulfur in the urine as normal persons independently of the diet, but he said that there is no increase in the nitrogen eliminated (compare Meyer-

1. Miller, J. L.: Critical Review of Literature on Chronic Rheumatism, Arch. Int. Med. 57:213 (Jan.) 1936.
2. Until comparatively recently there has been great confusion in the terminology of arthritis and there is still some want of harmony; the terminology in this report is that used by the author cited.
3. Pemberton, Ralph: Arthritis and Rheumatoid Conditions: Their Nature and Treatment, Philadelphia, Lea & Febiger, 1930.
4. Miller, H. E.: Colloidal Sulfur in Dermatology, Arch. Dermat. & Syph. 31:516 (April) 1935.
5. Bory, L.: Compt. rend. Soc. de biol. 63:512, 1907.
6. Fleig, C.: Compt. rend. Soc. de biol. 63:625, 1907.
7. Cawadias, A.: Therapeutic Action of Colloidal Sulfur, Bull. Acad. de méd., Paris 78:329 (Sept. 25) 1917.
8. Comrie, J. D.: Trench Rheumatism, Lancet 1:991 (June 30) 1917.
9. Meyer-Bisch, R., and Basch, E.: Biochem. Ztschr. 118:39, 1921.
10. Heubner, W., and Meyer-Bisch, R.: Biochem. Ztschr. 120:136, 1921.
11. Meyer-Bisch, R.: Sulfur in Arthritis Deformans, Klin. Wchnschr. 1:575 (March 18) 1922; Treatment of Chronic Arthritis with Sulfur, München. med. Wchnschr. 68:516 (April 29) 1921.
12. Rohde, E.: Abstr., Klin. Wchnschr., 1922, p. 864.
13. Reimann, H. A., and Pucher, G. W.: Use of Sulfur in Treatment of Arthritis Deformans, Am. J. M. Sc. 168:77 (July) 1924.
14. Vogel, Karl: Am. J. M. Sc. 168:89 (July) 1924.
15. Nitto, S.: Poisoning by Sulfur During the Treatment of Scabies, Jap. J. Dermat. & Urol. 34:434 (Sept.) 1934; abstr., Arch. Dermat. & Syph. 34:503 (Sept.) 1936.
16. Cawadias, A.: Rheumatoid Arthritis: Its Causation and Treatment, Brit. M. J. 2:602 (Oct. 3) 1925.

Bisch); he found no increase in the ethereal sulfates, indicating that there is no destruction of cartilage, since chondroitin sulfuric acid is excreted as ethereal sulfate. Cawadias attributed the increased sulfur elimination to a special disturbance of metabolism in which the patient with rheumatoid arthritis has lost the capacity for retaining sulfur in the tissues. This paper (without title) was presented in a symposium on rheumatoid arthritis in which ten authorities participated, but Cawadias was the only one who recommended the use of sulfur. Rolleston mentioned the long continued popularity of sulfur as an intestinal disinfectant, but it is apparent that Rolleston was not impressed favorably with the report of its use in the treatment of arthritis.

Race [17] (1927) referred to a paper of that year by Cawadias and was inclined to accept the view that there is deficient oxidation in arthritis, but he did not agree with Cawadias that there is an excessive sulfur metabolism in arthritis deformans.

Schlesinger [18] (1931) stated that he found the parenteral administration of sulfur of value in the treatment of neuralgias, syphilis and chronic arthritis. He abandoned the use of 1 per cent solution of colloidal sulfur in olive oil because of the pain induced by the injection.

Wheeldon and Main [19] (1933) determined the toxicity of colloidal sulfur in experiments on dogs, rabbits and guinea pigs and stated that it may be used therapeutically without danger. They used healthy animals, presumably; hence their results throw little light on the contraindications due to abnormal conditions.

Cecil [20] (1933) said with reference to rheumatoid arthritis: "Drugs can be quickly dismissed. Iron for anemia, arsenic and strychnine for their tonic effects, the salicylates to ease pain—that about covers it." He [21] discussed the medical treatment of chronic arthritis in 1934, at which time he said "I have been quite disappointed in the results obtained from various forms of sulfur and the various preparations of iodine that have been recommended."

Woldenberg [22] (1934, 1935) reported extraordinary success in the treatment of arthritis with colloidal sulfur. These papers will not be reviewed further in this place because of the severe criticism of Hench and others [23] (1936); of the second of these they state (p. 830): "It is difficult indeed to believe these extravagant statements, particularly in view of the more conservative reports of others. The patients received physiotherapy daily. No control series was observed and no details of the follow-up are given." Woldenberg [24] (1937) reported that 356 patients had been treated with colloidal sulfur. The later paper is principally a continuation of the first two.

Sullivan and Hess [25] (1934) found an average of 11.69 per cent of cystine in the finger nails of twenty-six normal persons and an average of 9.77 per cent in 103 patients suffering with arthritis. They recommended the use of sulfur on the theory that patients with arthritis have some material which reacts injuriously with sulfur. Seven patients were treated with colloidal sulfur by Argy [26] (1934), who reported that six showed some clinical improvement with an increase in the cystine content of the nails. He stated that fever was not induced; there was slight extravasation with sloughing in one case.

Klauder and Brown [27] (1935) also reported that the sulfur content of the hair and nails was below normal in 91 per cent of thirty-three patients having various systemic infections, including some with chronic arthritis.

Senturia [28] (1934) reported improvement in 75 per cent of sixty unselected patients suffering with arthritis and rheumatoid conditions treated by the intramuscular injection of colloidal sulfur. He reported a total of 1,035 injections. He found no difference in the therapeutic effects of intramuscular and intravenous injections. There was no fever after intravenous injection, but there was an occasional slight rise of temperature after intramuscular injection, and some pain when any of the fluid escaped into the subcutaneous tissue. Senturia states that no other therapeutic measures were used in these cases. He also states that there are no contraindications.

Wheeldon [29] (1935) reported the use of colloidal sulfur in the treatment of 892 patients suffering with arthritis. An analysis of this paper would seem unnecessary, especially since it is readily available to those who are interested in the subject.

Krestin [30] (1935) reported the results of treatment of fifty patients with chronic nonspecific arthritis with intramuscular injections of sulfur. Eighteen showed good results in thirty cases in which the bony changes were slight or moderate; none were so classed among fourteen in which there were advanced bony changes or the patients had osteo-arthritis. Krestin states that it is extremely difficult to determine the value of any treatment in chronic arthritis, for, excluding specific conditions, such as gout and gonorrhea, striking improvement occurs spontaneously occasionally or after the most diverse treatment. He discontinued the use of colloidal sulfur as unsatisfactory. He mentions numerous contraindications, including advanced age, emaciation, feebleness, nervousness, hysteria or psychopathic condition, the presence of organic disease (other than arthritis) and obesity (compare Senturia).

Rawls, Gruskin and Ressa [31] (1935) reported the results of treatment of 100 patients with sulfur. They reported that fairly large doses of colloidal sulfur (from 10 to 30 mg. twice a week) are usually well tolerated but that larger doses induce toxic symptoms in some cases; these include fatigue, drowsiness, headache, increased pain, stiffness or swelling of the joints, which usually disappeared in hve days. They reported that the cystine content of the nails was increased in those cases in which it had been below normal, the improvement being greater in those in which the cystine content had been subnormal. They believed that colloidal sulfur is a valuable agent in the treatment of certain types of arthritis.

Sashin and Spanboch [32] (1935) administered an average of 600 mg. (totals) of colloidal sulfur to twenty ambulatory patients. They state: "From our small series of twenty cases, no definite conclusions can be drawn as to the efficacy of colloidal sulfur in the treatment of rheumatoid and osteo-arthritis. This form of therapy deserves further study and observation."

Kinsella [33] (1935) stated that nothing very important had been accomplished in the treatment of some fifty to sixty patients suffering with rheumatoid arthritis in the orthopedic clinic associated with the arthritis clinic of Desloge Hospital but that the mere fact that from seventy-five to 100 injections were given [to each patient] is an indirect argument against the value of the drug.

Forbes and others [34] (1936) reported that a majority of patients suffering with chronic arthritis improved on diets which were high in protein and low in carbohydrates; especially was this true of those having the rheumatoid type, and coincident with the improvement indoluria diminished and then disappeared. This suggested that indole is causally related to chronic arthritis and that a diet rich in sulfur is indicated. They suggest that

17. Race, J.: Sulfur Metabolism, Lancet 2:142 (July 16) 1927.
18. Schlesinger, H.: Erweiterung der Indikationen für die Schwefeltherapie bei chronischen Erkrankungen, München. med. Wchnschr. 78:1300 (July 31) 1931.
19. Wheeldon, T. F., and Main, R. J.: Use of Colloidal Sulfur in Treatment of Arthritis, J. Bone & Joint Surg. 15:94 (Jan.) 1933.
20. Cecil, R. L.: Rheumatoid Arthritis: New Method of Approach to Disease, J. A. M. A. 100:1220 (April 22) 1933.
21. Cecil, R. L.: Medical Treatment of Chronic Arthritis, J. A. M. A. 102:1583 (Nov. 24) 1934.
22. Woldenberg, S. C.: Sulfur (Colloidal) Therapy in Treatment of Arthritis, with Report of 100 Cases, M. Rec. 139:161 (Feb. 21) 1934; Treatment of Arthritis with Colloidal Sulfur: Report of 250 Cases, South. M. J. 28:675 (Oct.) 1935.
23. Hench, P. S., and others: The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1935, Ann. Int. Med. 10:754 (Dec.) 1936.
24. Woldenberg, S. C.: Clinical Evaluation of Colloidal Sulfur in Treatment of Arthritis, J. Bone & Joint Surg. 19:100 (Oct.) 1937.
25. Sullivan, M. X., and Hess, W. C.: Cystine Content of Finger Nails in Arthritis, J. Bone & Joint Surg. 16:185 (Jan.) 1934.
26. Argy, W. P.: Arthritis: Treatment with Sulfur by Intravenous and Intramuscular Injection, J. Bone & Joint Surg. 16:909 (Oct.) 1934.
27. Klauder, J. V., and Brown, Herman: Sulfur Content of Hair and Nails in Abnormal States: Nails, Arch. Dermat. & Syph. 31:26 (Jan.) 1935.
28. Senturia, B.: Results of Treatment of Chronic Arthritis and Rheumatoid Conditions with Colloidal Sulfur, J. Bone & Joint Surg. 16:119 (Jan.) 1934.
29. Wheeldon, T. F.: Use of Colloidal Sulfur in Treatment of Arthritis, J. Bone & Joint Surg. 17:693 (July) 1935.
30. Krestin, David: Treatment of Chronic Nonspecific Arthritis with Intramuscular Injections of Sulfur, Brit. M. J. 2:1144 (Dec. 14) 1935.
31. Rawls, W. B.; Gruskin, B. J., and Ressa, A. A.: Value of Colloidal Sulfur in Treatment of Chronic Arthritis, Am. J. M. Sc. 190:400 (Sept.) 1935.
32. Sashin, David, and Spanboch, Joseph: Intravenous Injection of Colloidal Sulfur in Treatment of Rheumatoid and Osteo-Arthritis, M. Rec. 142:332 (Oct. 2) 1935.
33. Kinsella, E. A.: Medical Aspects of Chronic Arthritis, Radiology 24:410 (April) 1935.
34. Forbes, W. C., and others: Studies of Effect of High-Sulfur Low-Carbohydrate Diet in Chronic Arthritis, J. Lab. & Clin. Med. 21:1036 (July) 1936.

indoluria may be due to impaired liver function resulting from a deficiency of sulfur in the liver. All but six of their thirty-two patients, and all but two of twenty-two who had rheumatoid arthritis, improved markedly, but they were unable to determine whether that improvement was due to sulfur of the diet, to vitamin B or to the low carbohydrate diet.

This paper is cited at some length because of the very fact that while it contributes little or nothing to our knowledge of sulfur therapy it is more or less characteristic of a type of paper dealing with this subject, but it differs from many in its conservative attitude.

Johnson [35] (1936) reported that 500 patients having chronic arthritis were treated with sulfur at the Freedmen's Hospital during the years 1930-1935. He presented an analysis of twenty-two cases with complete relief in four, some relief in nine and little or none in four. Five refused to continue the treatment.

Clark [36] (1937) treated twenty selected patients suffering with mixed or hypertrophic arthritis, using total amounts of from 360 to 1,060 mg. of colloidal sulfur, the latter dose in a period of three months. He attributes his success to the relatively large doses and states that there was no fever, nausea, loss of appetite or other [undesired] reaction. He stated that he had observed the clinical course of a majority of the 892 cases reported by Wheeldon. Various measures, including diet, iodine, thyroid, salicylate, vaccine, neoarsphenamine, cacodylate, vitamin D or potassium iodide [not all for any one patient] had been used before the treatment with sulfur was begun. It is impossible to estimate the value of this paper, since so many measures were employed, and any improvement may have been spontaneous or due to delayed effects of other treatment.

Parmenter [37] (1937) reported that sulfur tends to normalize the body metabolism and vitalize cell tissues by supplying sulfur deficiency, shown by its effects on blood pressure, weight and symptomatology. He reported complete relief in 30 per cent of his cases and relief from pain and reduction of swelling of joints in 58 per cent. [See comment of Hench and others concerning various theories of the cause of chronic arthritis.]

Thompson, Wyatt and Hicks [38] (1938) presented an analysis of 343 cases of chronic arthritis, with treatment and a follow-up summary of 274, at the Wyatt Clinic and Research Laboratories at Tucson. They enumerate drugs used and state that "sulfur and gold have been disappointing in our experience but we have noted some beneficial effect with massive doses of vitamin D."

It is believed that the foregoing abstracts fairly represent the literature relating to the use of colloidal sulfur in the treatment of chronic arthritis as it is presented by those who have actually employed it in their own practice. The remainder of this review will be devoted mainly to citations of reviews by those best qualified to judge of the merits of the work of others in this field.

Irons [39] (1934) did not mention sulfur in his paper on the treatment of chronic arthritis, but he stated: "Any harmless therapeutic measure, whether actually effective or not, will, if instituted in the beginning of a natural remission, be followed by improvement and thus be credited with a value it does not deserve."

Pemberton [8] (1930), who is well known for his long continued and intensive studies of arthritis, stated (p. vi): "Many observations and measures of alleged value in arthritis have lacked in the past critical scientific basis." After discussing the work of Cawadias and that of Race he says: "On the basis of such findings, injections of various preparations of sulfur have been used extensively in Europe, though apparently less so in this country, but it is not clear that the advantages from their use are other than those which follow nonspecific protein at large, according to the work of Reimann and Pucher. It also appears that considerable soreness may ensue. . . . Perhaps in no other disease have so many drugs been advocated with so little success."

Joseph L. Miller [1] (1936) presented a critical review of the literature of chronic rheumatism. He stated: "Sulfur Therapy. . . . The recent literature contains numerous reports on the curative value of colloidal sulfur administered intramuscularly or intravenously. In none of the reports is mention made of suitable controls having been used or of a careful objective study of the reputed improvement. The period of treatment is prolonged, and this gives an opportunity for spontaneous improvement." Miller quotes Osler as follows: "In treatment the placid faith of the believer, not the fighting faith of the aggressive doubter, is our besetting sin." And Miller adds: "This statement, I believe, may be well applied to the therapy of rheumatoid arthritis in the past. It is the aggressive doubter who insists that the control method be employed." It may be added that many manufacturers must be reminded of this self-evident fact.

Hench and others presented the Third [23] (1936) and Fourth [40] (1938) Reviews of English and American Literature for the American Rheumatism Association, based on more than 1,100 papers and thirty-two books. Several quotations from these reviews suffice to show that the authors do not consider colloidal sulfur of much importance in the treatment of arthritis. They state that Todd [41] (1935) approved of sulfur therapy but that Dawson [42] (1935) found sulfur absolutely without [therapeutic] effect in twelve cases.

They [23] state (1936, p. 841) under "Factor of Altered Metabolism": "In contrast to the idea of a nonspecific metabolic defect from poor articular circulation is the theory that some more or less specific metabolic derangement is responsible, a disturbance in the utilization of sugar, of calcium, of sulfur. A defect of the last type is now a popular notion, and some believe that hypertrophic as well as atrophic arthritis is due to a deficiency of sulfur in the body, particularly in cartilage. The majority have made no attempt whatever to differentiate the types of arthritis in which they found reduced cystine in the nails or which improved on sulfur, labeling them "arthritis" or "chronic arthritis." They add: "It is impossible for a critical reader to form any conclusion when even the types of arthritis treated are not differentiated." Elsewhere they stress the value of controls as follows: "Herein, however, lies the difficulty in evaluating researches on treatment, for in most cases the measure used was but a part of a larger plan of treatment, though the writer often fails to mention the fact. *Thus the matter of setting up controls is so difficult, yet so important.*"

The Fourth Report [40] (1938) differs little from the Third so far as colloidal sulfur is concerned, as the following quotations show. With reference to atrophic arthritis they state: "Lacking a specific remedy, physicians have too often, like the children of Israel, wandered far after strange gods. Although some studies on therapy have been well controlled and have taken into consideration the natural history of arthritis and its tendency to spontaneous remissions, too many have consisted of uncritical observations of a few patients for a short time and are of little value. . . . The trend is away from drugs, since most of them have not justified themselves."

It would seem to be of great significance that not one of the leading arthritis clinics of the United States has adopted the use of sulfur in the treatment of arthritis, so far as can be determined.

Sulfur may have some therapeutic value in affording temporary symptomatic relief in some forms of arthritis, but the literature does not afford evidence concerning the type of cases in which it may be useful. It often induces fever (and other symptoms) but it is not known whether the fever will be useful or harmful in a given case. There is an almost total lack of knowledge concerning the contraindications. The optimum dose has not been determined. It is unsuited for experimental use except in institutions, or under other conditions in which its effects may be followed intelligently and accurately for prolonged periods.

35. Johnson, P. T.: Clin. Med. & Surg. 43:332, 1936.
36. Clark, M. M.: Clinical Experience with Colloidal Sulfur in Treating Mixed and Hypertrophic Arthritis, New York State J. Med. 37:369 (March 15) 1937.
37. Parmenter, D. C.: Sulfur Therapy in Arthritis: Preliminary Report of Some Clinical Results, Kentucky M. J. 35:14 (Jan.) 1937.
38. Thompson, H. E., Wyatt, B. L., and Hicks, R. A.: Chronic Atrophic Arthritis, Ann. Int. Med. 11:1793 (April) 1938.
39. Irons, E. E.: Treatment of Chronic Arthritis: General Principles, J. A. M. A. 103:1579 (Nov. 24) 1934.

40. Hench, P. S., and others: Present Status of Rheumatism and Arthritis: Review of American and English Literature for 1936, Ann. Int. Med. 11:1809 (Jan.) 1938.
41. Todd, A. T.: Systems of Treatment of Chronic Rheumatism, Practitioner 135:692 (Nov.) 1935, cited by Hench and others [40] (1938).
42. Dawson, M. H.: Nelson's Loose-Leaf Medicine, vol. V, p. 643.

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SATURDAY, OCTOBER 29, 1938

NONMEDICAL FACTORS AFFECTING HEALTH

Many factors other than the actual rendering of medical and allied services may affect the maintenance of good health and recovery from disease. Urban or rural residence is important in mortality and morbidity expectation. White infants born in the country today may expect to live about five years longer than white infants born in the city if they are boys and four years longer if they are girls.[1] Typhoid, however, takes relatively more than twice as many lives in rural areas as in cities. Rural residents continue to possess definite advantages over urban residents in health prospects.

Housing is a fundamental consideration in the general health problem. Poor housing is often associated with poverty, ignorance, inadequate food, long hours of toil, hazardous employment, unfavorable climate, unhygienic living and still other factors which have a more direct bearing on health.[2] While a house itself ordinarily does not have a significant part in regulating or controlling morbidity or mortality rates from communicable diseases, healthful living demands sanitary equipment in the environment. Poor housing influences the health of the occupants directly through the transmission of infection and through the debilitating effects of an unfavorable environment.

Climate is a factor of importance over which we have no control. Recent discussions indicate that climate may influence the nervous system,[3] the upper respiratory system[4] and rheumatic heart disease,[5] as well as many other conditions.[6] The importance long attached by some to the climate of spas and resorts is a further indication of its significance.

1. Dorn, H. F.: The Relative Amount of Ill Health in Rural and Urban Communities, Pub. Health Rep. **53**:1181 (July 15) 1938.
2. Horwood, M. P.: Housing and Health, Commonhealth **25**:95 (April-May-June) 1938.
3. Critchley, Macdonald: Climate and the Nervous System, J. State Medicine **45**:98 (Feb.) 1937.
4. Charlton, C. C.: Climate and the Upper Respiratory System, Arch. Otolaryng. **26**:1 (July) 1937.
5. Paul, J. R., and Dixon, G. L.: Climate and Rheumatic Heart Disease, J. A. M. A. **108**:2096 (June 19) 1937.
6. Lorenz, P.: Untersuchungen in der Klimakammer beim gesunden und kranken Menschen, Ztschr. f. klin. Med. **133**:178 (Dec.) 1937.

Disease and quite probably health are also definitely related to hereditary or constitutional factors. The hereditary diseases are too well recognized to require reemphasis; but the role of heredity in cancer,[7] which now seems to be established, as well as its possible place in the genesis of other less definitely recognized hereditary diseases,[8] indicates how heredity may affect general health. The importance of diet has been recently reemphasized by McLester,[9] by Langdon-Brown[10] and by Christiansen,[11] who call attention to the relation between nutrition and the health of whole peoples.

The effects of industry and occupation on groups and individuals is also of fundamental consequence. While occupational accidents and hazards of other kinds have received concentrated scrutiny in many industries, the effect of prolonged work under conditions perhaps unfavorable to the nervous system is only beginning to be recognized. No doubt the role which such factors have in the general picture will become clarified in the future. Finally the direct effects of poverty and economic status on the incidence of disease cannot be ignored. Poverty, or at least the deficiencies in environment associated with poverty, are directly related to the incidence of certain disease and subnormal conditions. Only recently factors of this nature have been reported both here and abroad.[12]

The whole problem of improving the health and the average life span of the American people is mingled with factors which the medical profession can regulate only indirectly rather than by the employment of its professional services alone.

VITAMIN C IN THE TONSILS AND BLOOD OF CERTAIN CHILDREN

The theory that deficiency of vitamin C may be a factor associated with rheumatic fever has been supported by clinical, experimental and epidemiologic data.[1] Studies of 107 children with active rheumatic fever in 1936 indicated a greatly increased metabolic use of vitamin C in those who suffer from the infection which underlies rheumatic fever.[2] Kaiser and Slavin[3] have recently studied the incidence of hemolytic streptococci in the tonsils in relation to the amount of

7. Bonne, C.: Cancer and Human Races, Am. J. Cancer **30**:435 (July) 1937.
8. Richardson, W.: A Note on Racial Incidence in Portal Cirrhosis, New England J. Med. **218**:257 (Feb. 10) 1938.
9. McLester, J. S.: The More Abundant Diet, J. Am. Diet. A. **14**:1 (Jan.) 1938.
10. Langdon-Brown, Wyman: Diet and the National Health, J. Roy. Inst. Pub. Health & Hyg. **1**:259 (Feb.) 1938.
11. Christiansen, Johanne: Nutrition and Disease in Denmark, Lancet **1**:336 (Feb. 5) 1938.
12. Reid, W. J. S., and Mackintosh, Jean M.: The Influence of Anemia and Poor Social Circumstances During Pregnancy on Subsequent History of Mother and Child, Lancet **2**:1389 (Dec. 11) 1937. Pisuh, Cecilia: Behavior Problems of Children from High and Low Socio-Economic Groups, Ment. Hyg. **21**:452 (July) 1937.

1. Rinehart, J. F., and Mettler, S. R.: Heart Valves and Muscle in Experimental Scurvy with Superimposed Infection, with Notes on Similarity of Lesions to Those of Rheumatic Fever, Am. J. Path. **10**:61 (Jan.) 1934.
2. Abbasy, M. A.; Hill, N. G., and Harris, L. J.: Vitamin C and Juvenile Rheumatism, Lancet **2**:1413 (Dec. 12) 1936.
3. Kaiser, A. D., and Slavin, Betty: The Incidence of Hemolytic Streptococci in the Tonsils of Children as Related to the Vitamin C Content of Tonsils and Blood, J. Pediat. **13**:322 (Sept.) 1938.

vitamin C in the blood and in the tonsils themselves. One hundred and twenty-three children had been selected by school physicians for tonsillectomy. Five cc. of blood was withdrawn from a vein and a quantitative determination of the content of vitamin C was made the following morning. The tonsils were sent to the laboratory immediately after removal and a quantitative determination of the vitamin C content was made. To determine the presence of streptococci in the tonsils, the surface was seared and cut with a sterile knife; then from the cut surface loops were streaked on blood agar plates. Streptococci thus obtained were subcultured for determination of their virulence. These children were not acutely ill. They came from families on relief or families classed in the lower economic strata. Since ninety-six of the children were under observation for six months or more after tonsillectomy, it was possible to determine also something about the amount of vitamin C in the diet and the incidence of respiratory infections.

The vitamin C content of the blood varied from 0.5 mg. per hundred cubic centimeters to 1.08 mg., while that of the tonsils varied from 18.6 to 53.7 mg. Hemolytic streptococci were demonstrated in about 50 per cent of these children.

There was no constant relation found between the amount of vitamin C in the blood and that in the tonsils. Frequently children whose level of vitamin C in the blood was low showed an average or above average amount of vitamin C in the tonsils and vice versa. In a group of thirty-one children whose vitamin C content of the tonsils was low, 40 per cent of the tonsils showed evidence of hemolytic streptococci, while in a group of thirty children whose vitamin C content of the tonsils was high only 26 per cent of the tonsils showed evidence of hemolytic streptococci. A similar analysis by Kaiser and Slavin shows that in the group presenting the lower third of vitamin C blood values 55 per cent of the tonsils showed evidence of hemolytic streptococci, while in the upper third only 10 per cent of the tonsils showed evidence of streptococcic infection. There was a significant difference also in the percentage of hemolytic streptococci found in the tonsils. Hemolytic streptococci were found five times as often in cases in which the vitamin C blood values were 0.7 mg. per hundred cubic centimeters or less than when the blood values were 0.85 mg. or more. Further analyses of the data were made by mathematical methods which appear to show that the vitamin C content of the blood and of the tonsils is lower in children whose tonsils contain hemolytic streptococci than in those whose tonsils do not contain these organisms.

The significance of finding hemolytic streptococci in the tonsils was not clear, as there were no apparent symptoms present in the majority of children in whom the organisms were found. Virulence tests showed that 40 per cent of the streptococci in the tonsils of children having the lowest vitamin C values were virulent and that only 10 per cent of the streptococci found in those whose vitamin C values were above the average were virulent.

These results suggest that streptococci are less likely to be found in tonsils when the vitamin C values of the blood are high and that when present in such cases they are seldom virulent. While the vitamin C content of the blood is probably determined by the amount taken in with certain foods, the daily ingestion of a reasonable amount of orange juice apparently does not assure a high level of vitamin C in the blood in all instances. When generous amounts of vitamin C are taken daily in the form of fruit juices, the vitamin C blood levels are uniformly high or are in the average zone. The definite determination that there are fewer streptococci present in the tonsils of children with an average or better vitamin C content suggests an inhibitory relation. The desirability of supplying the children with more than the minimum amount of vitamin C in their diets is obvious.

Current Comment

INCREASE IN FELLOWSHIP DUES AND IN THE SUBSCRIPTION PRICE OF THE JOURNAL

After careful consideration of all factors involved, the Board of Trustees by unanimous vote of its members has decided to increase the annual Fellowship dues and the subscription price of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION to $8 after Dec. 31, 1938. This decision of the Board of Trustees was taken in accordance with the provisions of the By-Laws of the Association authorizing the Board to fix the annual Fellowship dues and subscription price of THE JOURNAL at a sum not in excess of $8 and to announce the amount in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION not later than November 1 of each year. This action of the Board, whereby the annual Fellowship dues and subscription price of THE JOURNAL will be increased by the sum of $1 beginning Jan. 1, 1939, was made necessary by the constantly expanding work of the Association and by reason of certain contingencies that have arisen which will undoubtedly require some unusual expenditures during the coming year. Annual Fellowship dues and subscription to THE JOURNAL, under the provision of the By-Laws, are payable in advance on the first day of January of each year.

"LIFE" AIDS ANIMAL EXPERIMENTATION

Life for October 24 is for American medicine a new and greatly appreciated ally. The benefits which have come to mankind through the use of animals are clearly presented and the advantages of research on animals are shown to the public in a telling pictorial fashion. Thus an issue long hidden from public understanding is now brought clearly before the American people. Perhaps the natural smugness which settles on a comfortable people will be rudely shattered by this exposition of factual data. But the people as a whole must recognize the difficulties which a small but vociferous minority have thrown in the way of medical progress. Each of us must assist in every way possible. Encourage patients to study this issue of *Life*. Amplify the statements for them so that they may comprehend how modern medicine came into existence through investigation on animals. Be prepared to show that the discovery of bacteria as a cause of infectious diseases not only is the basis of modern surgery, which would not exist without a complete understanding of bacteria, but is largely responsible for the extension of life in our day and generation. Tell your patients that other types of disorders have yielded secrets under animal investigation, for example, the use of insulin in the treatment of diabetes and of liver in the treatment of pernicious anemia. Explain the powerful roles assumed by minute quantities of chemical substances known as vitamins and hormones, and indicate that these also have been discovered through animal investigation. Those physicians who must each year hie themselves to the committee rooms of state capitols to protect further scientific endeavor in laboratories for the good of the people will be relieved that such a powerful aid has come to their assistance. Former generations looked on animal investigators as monsters and blasphemed the people who sought to help them. That ancient attitude still prevails in a few places. Remember that the "Humane Pound Law" is to be voted on by the citizens of California on November 8. Public opinion will be formed in the next few weeks. The responsibility for this opinion rests with the medical profession and their biologic colleagues.

DRUGS IN TREATMENT OF ARTHRITIS

Elsewhere in this issue (page 1657) appears a report of the Council on Pharmacy and Chemistry on colloidal sulfur in the treatment of arthritis. This report, based on an extensive review of the literature, points out that studies to date have failed to indicate the type of case in which sulfur may be useful, the contraindications or the optimal dose. The Council concurred in the referee's conclusions and voted not to accept any form of sulfur for the treatment of arthritis at present. The introductory statement affirms that before acceptance satisfactory evidence must be produced that sufficient controls have been employed and that follow-up periods of sufficient length to rule out spontaneous remissions have been observed. Further, the types of cases in which the preparation may be used with a fair expectation of benefit must be determined, and the chief contraindications, optimal dosage and best form and route for use must be defined. These criteria as outlined for sulfur therapy in arthritis could well be employed in assessing the value of any other of the many drugs employed in this chronic and clinically variable disease. That they have not been so employed, however, is demonstrable by the repeated exploitation of numerous proprietary remedies with extravagant claims as cure-alls for arthritis of all types. While considerable skepticism as to the value of colloidal sulfur in arthritis has previously been expressed elsewhere, this report of the Council should serve to crystallize the objections to accepting this form of therapy as in any way scientifically established. Likewise, the criteria outlined in the introduction are just as applicable to other therapeutic agents employed in this chronic disease or for that matter any other long continued protean disease process. No doubt further uncontrolled favorable reports of drug therapy in arthritis will appear in the literature but subsequent studies on this subject emanating from reliable sources will doubtless pay more attention to the critical evidence required.

RHYTHM IN EPILEPSY

In addition to recording the incidence of epileptic fits in 110 boys and men among the patients in the Lingfield Epileptic Colony over prolonged periods, Griffiths and Fox [1] noted the effects of drugs and other factors on the frequency and time of appearance of the convulsions. Charts were constructed including all major attacks and minor attacks involving loss of consciousness with or without partial convulsion. A study of the charts showed that many patients have fits either singly or in groups at regular intervals. Observation of the time of day of fits showed that many epileptic patients have a predilection for certain hours for their fits. If all fits, both major and minor, of the 110 patients studied (39,929 fits) are assembled, the greatest incidence appears between 6 and 7 a. m., there being a steady rise from 3 a. m. to this peak and an abrupt fall at 8 a. m. The next most popular time for fits was between 5 and 9 p. m. and between 9 and 11 a. m. These investigators also observed the effect of phenobarbital, bromide, borax, chloral and certain other commonly employed drugs on the convulsions. They are able to report a number of cases in which the day was cleared of fits by phenobarbital, bromide, borax or a combination of two of them. The determination of the individual patient's inherent or constitutional time incidence of fits requires a considerable period of observation without any drugs, but, when this method is followed, inherent rhythms both of a "long distance" and a "time of day" type have been found in many cases. Furthermore, in such cases the effective modification of the "time of day" rhythm frees them from the risk of accident and from interference with their daily occupation. While further clinical and biochemical investigations are indicated, this series of observations may well be linked at some future time with the recently reported encephalographic studies of the same disease.

1. Griffiths, G. M., and Fox, J. T.: Rhythm in Epilepsy, Lancet 2: 409 (Aug. 20) 1938.

ORGANIZATION SECTION

GRAND JURY INVESTIGATES ORGANIZED MEDICINE

On October 17 the special grand jury called in the District of Columbia to investigate organized medicine began its study. The attorneys representing the government include John Henry Lewin, a special assistant selected by the Department of Justice, former city solicitor in Baltimore and later the people's counsel to the Maryland Public Service Commission. He is a graduate of Johns Hopkins University and the Harvard Law School. In 1933 he became a member of the trial section of the A. A. A. legal division and in 1937 conducted the government's antitrust case in Madison, Wis., against the oil companies. Mr. Lewin is 40 years old and was for a while editor of the *Harvard Law Review*.

His principal assistant in the case is Allan Hart of Portland, Ore., who first came to the attention of Mr. Thurman Arnold at Yale. In 1926 Mr. Hart was appointed assistant United States District Attorney in Portland and he was taken from that position to assist Mr. Arnold in Washington.

In addition to these two attorneys, the Department of Justice is utilizing Grant W. Kelleher and Douglas B. Maggs, the latter called to the Department of Justice from Duke University specifically for this case.

The first of the witnesses to be called before the grand jury was Dr. Hugh Cabot. It is understood that the attorneys for the Department of Justice wished to keep secret, if possible, the names of witnesses to be called before the grand jury. In interviews with reporters after testifying, Dr. Cabot declined to discuss his testimony but, according to the press, while waiting to be summoned to the grand jury room he discussed his theories of medical service. He deprecated proposals to subsidize treatment in the hands of private practitioners for people unable to afford regular medical charges. Apparently Dr. Cabot indicated his conviction that medicine is not a "trade." He is also reported to have said "Whether a criminal prosecution is the right approach to the problem I cannot say; I am not expert on criminal prosecutions. However, I can say that other methods which have been employed have not been successful; the problem remains unsolved."

The second witness called was Michael M. Davis, who is still called by the newspapers "a leader of the medical profession." Mr. Davis was associated with the Rosenwald Foundation and the Committee on the Costs of Medical Care and is now listed as chairman of the National Committee for Research in Medical Economics—a body which apparently he has organized.

The third witness seems to have been Mr. Charles W. Taussig, president of the American Molasses Company. Mr. Taussig was apparently the only representative of capital to take part in the National Health Conference. He has not been heard of previously in relationship to problems of medical care.

The fourth witness was one Clem Linnenberg, staff economist of the antitrust division of the Department of Justice. Reporters indicate that when he entered the grand jury room he was accompanied by a large chart which was carried by court attendants.

As we go to press there are indications that additional witnesses will be Theodore Wiprud, executive secretary of the Medical Association of the District of Columbia, and William C. Woodward, director of the Bureau of Legal Medicine and Medical Legislation of the American Medical Association.

PROFESSION COMMENDED BY ILLINOIS STATE CONVENTION

At the Republican State Convention in Peoria, Ill., August 31, the following resolution commending the medical profession was unanimously adopted:

The Republican Party commends the medical profession for its fine and sacrificial service rendered mankind. We believe that profession should be protected as an independent force for human good free from political domination or control. The American doctor has earned the praise and acclaim of the world by his unselfish efforts administering to human ills.

The Republican Party pledges protection to a free and independent medical profession.

To meet the needs of those unable to obtain proper medical attention, we recommend that a system of medical care be established by the proper state and local medical associations assisted when necessary by the state.

MEDICAL EXHIBITS AVAILABLE FOR LOAN

Exhibits pertaining to the work of the various departments of the American Medical Association or to subjects in which those departments are interested have been prepared and are available on a loan basis. The material falls into two groups:

Exhibits for medical societies and other scientific organizations.

Exhibits for the public for use at fairs and expositions.

Requests for material should be instituted as far in advance as possible, so that the proper reservations can be made. Requests from groups other than medical societies should be made through the secretary of the local county or state medical society, or approval of such society obtained. Exact shipping addresses and dates should be given when the request is made.

Responsibility for installation and demonstration of the exhibits ordinarily must be borne by the organization to which the material is lent. The American Medical Association does not have the personnel for such duties.

Expenses include the items incidental to the installation and demonstration of the exhibit, as well as transportation charges.

A brief description of each exhibit is given in the following list. The notation is made whether the exhibit is intended for medical meetings or for public audiences; in a few instances both groups may be interested. The approximate amount of necessary wall space is indicated in linear feet; 30 linear feet could be provided in a straight line along the wall or around three sides of a booth 10 feet wide by 10 feet deep, with the side walls extended to the aisle in front. The electrical connections may be served either by alternating current or direct current unless otherwise noted; only 110 volts should be used, however. The shipping weights given are in approximate figures. Shipments will be made either by freight or by express, according to request.

Further information may be obtained from

Director, Scientific Exhibit
American Medical Association
535 North Dearborn Street
Chicago, Illinois.

1. What the Public Is Thinking About Health.

An exhibit from the Bureau of Health Education consisting of a mechanical display, summarizing 10,000 questions asked by the public; ten posters each 22 by 38 inches depicting various methods of disseminating health information; display files containing brief paragraphs on 200 health subjects.

Audience, public.

Space required, 25 linear feet of wall space (booth 10 by 10 feet with side walls extended out to front of booth.)

Electrical connections, one outlet, 150 watts, 110 volts, alternating or direct current.

Shipping weight, 380 pounds.

3. The Doctor Prevents Disease.

An exhibit from the Bureau of Health Education consisting of twelve posters, each 22 by 28 inches, showing means by which the physician may reach the public for the dissemination of health information.

Audience, medical.

Space required, about 14 linear feet of wall space.

Shipping weight, 44 pounds.

5. Information About Health.

An exhibit from the Bureau of Health Education consisting of two mechanical pieces about 45 inches high by 24 inches wide, with buttons for the visitor to push; six posters on health subjects, each 22 by 28 inches; three exposition files containing brief paragraphs on some 200 health topics; three exposition microscopes showing bacteria.

Audience, public.

Space required, about 16 linear feet of wall space, with a table in front 6 feet long (booth 10 by 10 feet with side walls).

Electrical connections, one outlet requiring about 200 watts.

Shipping weight, 477 pounds.

Note: One or both of the mechanical pieces can be eliminated, reducing the weight to 258 pounds.

6. The Human Factory.

An exhibit from the Bureau of Health Education consisting of three transparencies showing the human body in the form of a factory, the digestive system and the circulatory system; four posters, each 22 by 28 inches, depicting various functions of the "factory"; three models showing the skin, the head and the bladder; three display files containing brief paragraphs on topics in physiology.

Audience, public.

Electrical connections, six outlets, requiring about 600 watts, 110 volts, alternating or direct current.

Shipping weight, about 530 pounds.

8. Periodic Health Examinations.

An exhibit from the Bureau of Health Education consisting of one piece 8 feet long by 4 feet high containing transparencies together with a transparent mirror with a button for visitors to push.

Audience, public.

Space required, 8 feet.

Shipping weight, 300 pounds.

9. Dangers of Self Diagnosis and Self Medication.

An exhibit from the Bureau of Health Education consisting of one piece 8 feet long by 4 feet high containing transparencies together with a transparent mirror with a button for the visitor to push; two mechanical pieces to be operated by the visitor; three exposition files containing information about home treatment, the home medicine cabinet and when to call the doctor.

Audience, public.

Space required, about 15 linear feet.

Electrical connections, about 900 watts.

Shipping weight, 543 pounds.

10. Nutrition.

An exhibit from the Bureau of Health Education consisting of two transparency cases, each about 45 inches high by 24 inches wide, showing various forms of malnutrition; nineteen posters in frames, each 24 by 30 inches, dealing with various aspects of nutrition; a large number of models of food products showing calories and other details, together with glass cases in which the models may be exhibited.

Audience, medical, public or other groups according to the demonstration.

Space required, about 30 linear feet of wall space.

Electrical connections, five outlets with a total of 500 watts.

Shipping weight, about 400 pounds.

11. Prevention of Accidents.

An exhibit from the Bureau of Health Education consisting of four panels, each 3 feet wide, equipped with legs and apron ready to set up, on which are posters dealing with traffic accidents, Fourth of July accidents, playground accidents and accidents in the home; mechanical "scrambler" carries appropriate messages; transparent mirror with buttons for the visitor to push showing appropriate cartoon; two exposition files containing brief paragraphs on some seventy-five items relating to accidents.

Audience, public and special groups.

Space required, 10 linear feet.

Electrical connections, two outlets, 300 watts, 110 volts, alternating or direct current.

Shipping weight, about 400 pounds.

12. Infant Welfare and Child Health.

An exhibit from the Bureau of Health Education consisting of eight posters, each 22 by 28 inches, dealing with various phases of antepartum care, infant feeding, and the like, and a mechanical piece with buttons for the visitor to push.

Audience, public.

Space required, 12 linear feet.

Shipping weight, about 100 pounds.

13. Medical Discoveries of a Century.

An exhibit from the Bureau of Health Education originally shown at A Century of Progress Exposition in Chicago, consisting of nine groups of figures—Beaumont, Morton, Pasteur, Lister, Roentgen, Theobald Smith, Curie, Ehrlich and Banting. Each group is set in a case with indirect lighting.

Audience, medical or public.

Space required, 16 linear feet (no back wall necessary).

Electrical connections, nine outlets, each for a 60 watt lamp.

Shipping weight, about 672 pounds.

14. Individual Health.

An exhibit from the Bureau of Health Education consisting of a series of twelve dioramas covering such subjects as nutrition, exercise and rest, weight control, correction of defects, avoidance of infection, and intelligence in health matters.

Audience, public.

Space required, 24 linear feet.

Electrical connections, twelve outlets, using a total of about 1,000 watts.
Shipping weight, about 951 pounds.

16. Your Health: The A. M. A. Broadcast.

An exhibit from the Bureau of Health Education dealing with the radio program of the American Medical Association consisting of a panel 4 feet wide by 6 feet high; an automatic bulletin board containing various messages; an automatic bar chart showing the number of responses to different types of programs; two exposition racks, one containing a Workbook for schools and the other for questions.
Audience, medical or public.
Space required, about 10 linear feet.
Electrical connections, two outlets requiring about 200 watts.
Shipping weight, about 352 pounds.

17. Information About Syphilis.

An exhibit from the Bureau of Health Education consisting of two transparency cases showing various syphilitic lesions; a large exposition microscope showing Spirochaeta pallida; an exposition file containing brief paragraphs on the subject of syphilis together with various charts and posters.
Audience, public.
Space required, about 15 linear feet.
Electrical connections, three outlets, about 600 watts.
Shipping weight, about 260 pounds.

18. Increase in Stature.

An exhibit from the Bureau of Health Education which was shown at A Century of Progress in Chicago, showing increase in stature from 1893 to 1933; one panel 3 feet wide by 6 feet high.
Audience, public.
Shipping weight, 157 pounds.

24. Prevention of Eye Injuries.

An exhibit from the Bureau of Health Education in conjunction with the Section on Ophthalmology of the American Medical Association, consisting of miscellaneous posters on panels ready to set up. The panels are accompanied by a transparency case showing transparencies of various eye injuries.
Audience, public.
Space required, 10 linear feet.
Electrical connections, three outlets, with a total of about 400 watts.
Shipping weight, 240 pounds.

25. Prevention of Burns.

An exhibit from the Bureau of Health Education, in conjunction with the Milwaukee Children's Hospital, consisting of miscellaneous posters on panels ready to set up and accompanied by a transparency case showing various injuries caused by burns. Where suitable arrangements can be made, a motion picture film on burns can be used with the exhibit. This will not be sent unless specifically requested. Motion picture, 16 mm., one reel, silent.
Audience, public.
Space required, 10 linear feet.
Electrical connections, two outlets with a total of about 400 watts.
Shipping weight, 240 pounds.

31. Information About Hospitals.

An exhibit from the Council on Medical Education and Hospitals consisting of a mechanical model of a hospital entrance with doors opening and shutting every four seconds to indicate how often a patient enters a hospital in the United States; shadow boxes and miscellaneous charts.
Audience, medical or public.
Space required, 15 linear feet of wall (or more according to selection of material).
Shipping weight, according to material selected.

32. Medical Education.

An exhibit from the Council on Medical Education and Hospitals consisting of charts showing statistics on medical education in the United States, together with miscellaneous maps and literature.
Audience, medical.
Space required and shipping weight, according to amount of material selected.

41. "Patent Medicines" and Quackery.

An exhibit from the Bureau of Investigation consisting of three mechanical pieces and twenty-eight posters, each 22 by 28 inches, with a literature rack for pamphlets.
Audience, public.
Space required, about 35 linear feet of wall for the entire exhibit, but selections can be made to accommodate a smaller area.
Shipping weight, about 350 pounds.

42. "Patent Medicine" Testimonials.

A small portion of exhibit 41 on "patent medicines" and quackery, which has been expanded, consisting of six posters, 22 by 28 inches, and two mechanical pieces.
Audience, public.
Space required, about 16 linear feet of wall.
Shipping weight, about 250 pounds.

46. Food Fads.

An exhibit from the Bureau of Investigation consisting of a mechanical piece; six posters each 22 by 38 inches and a "scrap-book," all dealing with some of the popular, but foolish, food fads.
Audience, public.
Space required, about 16 linear feet of wall.
Electrical connections, two outlets for 300 watts.
Shipping weight, 284 pounds.

47. Mechanical Nostrums.

An exhibit from the Bureau of Investigation showing a dozen fantastic mechanical contraptions for curing human ailments; display files containing brief paragraphs on many additional mechanical nostrums.
Audience, medical or public.
Space required, about 20 linear feet.
Shipping weight, 330 pounds.

51. Work of the Council on Pharmacy and Chemistry.

An exhibit from the Council on Pharmacy and Chemistry consisting of miscellaneous posters, each 22 by 28 inches, from which selections can be made to fit any space desired.
Audience, medical.
Shipping weight, from 40 to 50 pounds.

52. Work of the A. M. A. Chemical Laboratory.

An exhibit from the Chemical Laboratory, similar to the one from the Council on Pharmacy and Chemistry, consisting of posters from which selections can be made to fit any space desired.
Audience, medical.
Shipping weight, from 40 to 50 pounds.

53. Work of the Council on Foods.

An exhibit of the Council on Foods consisting of miscellaneous posters, each 22 by 28 inches, and an exposition "scrap-book" containing the various items of information concerning the work of the Council.
Audience, medical or public.
Space required, about 10 linear feet.
Shipping weight, according to amount of material selected.

54. Work of the Council on Physical Therapy.

An exhibit from the Council on Physical Therapy consisting of miscellaneous charts in frames, each 22 by 28 inches, together with selected apparatus. The following groups have been found

of interest: short wave diathermy; simple apparatus for physical therapy; miscellaneous posters dealing with the work of the Council.
Audience, medical.
Space required, variable according to kind of material selected.
Electrical connections, one or more outlets if mechanical material is selected.
Shipping weight, variable according to material selected.

55. Posture.

An exhibit from the Council on Physical Therapy consisting of four charts, each 22 by 28 inches, and six charts, each 36 by 26 inches.
Audience, public.
Space required, about 10 linear feet.
Shipping weight, 152 pounds.

56. Home Appliances for the Treatment of Poliomyelitis.

An exhibit from the Council on Physical Therapy consisting of charts in frames, each 22 by 28 inches; samples of home-made splints and a model of an underwater treatment tank, tools (vise, hammer, pliers), wire and padding material out of which the splints are made. Charts show the methods of making the splints, using the tools and material at hand.
Audience, medical.
Space required, booth about 10 feet wide by 7 feet deep.
Shipping weight, 100 pounds.

61. Medical Economics.

An exhibit from the Bureau of Medical Economics consisting of miscellaneous charts; a rack for literature showing the publications of the Bureau, two exposition files containing various items of information concerning medical economics, and an automatic bar chart showing physicians in various countries.
Audience, medical or public.
Space required, 30 linear feet or less, according to the kind of material selected.
Electrical connections, one outlet about 200 watts.
Shipping weight, 465 pounds.

66. Basic Science Laws.

An exhibit from the Bureau of Legal Medicine and Legislation consisting of six charts and frames, each 22 by 28 inches, together with a shadow box.
Audience, medical.
Space required, 15 linear feet.
Electrical connections, one outlet, 120 watts.
Shipping weight, 164 pounds.

67. Medical Legislation and Medicolegal Topics.

An exhibit from the Bureau of Legal Medicine and Legislation consisting of miscellaneous charts in frames, each 22 by 28 inches.
Audience, medical.
Space required, a booth of 15 linear feet.
Shipping weight, about 60 pounds.

71. Cutaneous Granulomas.

An exhibit from the Scientific Exhibit of the A. M. A., in conjunction with the Section on Dermatology and Syphilology, consisting of some 200 photographs and various granulomas. The photographs are mounted on eight panels, each 5 feet high and 3 feet wide with legs 2½ feet high, which can be installed readily.
Audience, medical.
Space required, 24 foot back wall by 3 feet deep.
Shipping weight, 377 pounds.

72. Cutaneous Manifestations of Syphilis.

An exhibit from the Scientific Exhibit of the A. M. A., in conjunction with the Section on Dermatology and Syphilology, consisting of about 150 photographs of the various syphilitic lesions in different stages of the disease. The photographs are mounted on panels 5 feet high by 3 feet wide with legs 2½ feet high, which can be installed readily.
Audience, medical.
Space required, 18 foot back wall by 3 feet deep.
Shipping weight, 327 pounds.

73. Histopathology of Cutaneous Syphilis.

An exhibit from the Scientific Exhibit of the A. M. A., in conjunction with the Section on Dermatology and Syphilology, consisting of some seventy-five transparencies showing the histopathology of cutaneous syphilis.
Audience, medical.
Space required, 10 linear feet.
Electrical connections, three outlets requiring a total of 1,200 watts.
Shipping weight, 327 pounds.

77. Information About the American Medical Association.

An exhibit from the Scientific Exhibit of the A. M. A. consisting of two displays—one showing the history of the American Medical Association and the other showing the activities. Several literature racks are available to show the different publications, pamphlets and books which the Association publishes.
Audience, medical or public.
Space required, about 20 linear feet.
Electrical connections, two outlets with about 500 watts.
Shipping weight, 750 pounds.

78. Aesculapius, Hygeia and Hippocrates.

Three plaster plaques in bas-relief from the Bureau of Exhibits showing Aesculapius, Hygeia and Hippocrates. Each figure is 8½ feet high, 3 feet wide, and 6 inches thick. Because of the fragile nature of the plaques, they will be sent only where they can be suitably installed.
Audience, medical or public.
Shipping weight, Aesculapius, 343 pounds; Hygeia, 354 pounds; Hippocrates, 300 pounds.

82. Treatment of Early Syphilis.

An exhibit from the Bureau of Exhibits, in conjunction with the United States Public Health Service, consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of early syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)
Audience, medical.
Space required, 15 linear feet.
Shipping weight, 125 pounds.

84. Treatment of Prenatal Syphilis.

An exhibit from the Bureau of Exhibits, in conjunction with the United States Public Health Service, consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of prenatal syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)
Audience, medical.
Space required, about 15 linear feet.
Shipping weight, 81 pounds.

86. Treatment of Late and Latent Syphilis.

An exhibit from the Bureau of Exhibits, in conjunction with the United States Public Health Service, consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of late and latent syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)
Audience, medical.
Space required, about 15 linear feet.
Shipping weight, 119 pounds.

91. *Hygeia* in Office, School and Home.

An exhibit from the Bureau of Exhibits, in conjunction with *Hygeia*, the Health Magazine, consisting of five dioramas showing the use of *Hygeia* in office, school and home.

Audience, public.
Space required, 10 linear feet.
Electrical connections, five outlets, requiring a total of 300 watts.
Shipping weight, about 250 pounds.

92. *Hygeia*, the Health Magazine.

An exhibit from the Bureau of Exhibits, in conjunction with *Hygeia*, the Health Magazine, consisting of two mechanical pieces; four exposition files with questions and answers from *Hygeia*, and miscellaneous posters.

Audience, public.
Space required, about 15 linear feet.
Electrical connections, two outlets, requiring about 200 watts.
Shipping weight, about 250 pounds.

94. *Hygeia* Display.

An exhibit from the Bureau of Exhibits, in conjunction with *Hygeia*, the Health Magazine, consisting of a mechanical model showing the various features of *Hygeia*, the Health Magazine (rising sun model).

Audience, public.
Space required, table 6 feet long by 2 feet wide.
Electrical connections, one outlet with about 200 watts.
Shipping weight, 148 pounds.

OFFICIAL NOTES

RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company entitled "Your Health" began Wednesday, October 19, and will run consecutively for thirty-six weeks. The program is broadcast over the Blue network of the National Broadcasting Company each Wednesday at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).[1]

These programs are broadcast on what is known in radio as a sustaining basis; that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

November 2 Seeing and Hearing Well.
November 9. Healthier Boys and Girls.
November 16. Healthful Play.

Schools in the Chicago area that are planning to use the broadcasts as part of their health teaching program can tune in stations on the Blue network in nearby cities.

1. Owing to program conflicts, there will be no Chicago broadcast of the network program. Instead, a recording of the program will be broadcast over Station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

MEDICAL ECONOMIC ABSTRACTS

MATERNAL CARE IN MICHIGAN

The Division of Public Health Methods of the National Institute of Health of the United States Public Health Service has made a study of obstetric practices in Michigan. An elaborate questionnaire was sent to every attendant whose name was signed to any birth certificate in the state. The replies to this questionnaire form the base of the study, the results of which are summarized as follows:

The present study constitutes an attempt to determine the quality and distribution of maternal health services rendered to Michigan women during pregnancy and childbirth. The data consist, first, of approximately 21,000 birth certificates, which represent the number registered during the first quarter of 1936, and, second, of 10,000 detailed obstetric histories for a reasonably representative sample of these births. Study of the records results in the following observations regarding birth attendants and maternal services that were rendered:

Physicians attend 96.5 per cent of the registered births in the state, the remaining 3.5 per cent being about equally divided among doctors of osteopathy and a group of unspecified persons who are nurses, friends, relatives and neighbors of the pregnant women. Approximately one half of the physicians in the state are engaged in the practice of obstetrics, as evidenced by the fact that they delivered one or more babies during the first quarter of 1936. Physicians listed in the American Medical Directory as specialists and partial specialists in obstetrics or gynecology represent 9 per cent of the total group of birth attendants; this group delivers one sixth of the total number of births. Physician birth attendants in other medical specialties represent 17 per cent of the attendants and deliver another one sixth of the babies. Approximately 80 per cent of the births are attended by members of the American Medical Association, the remaining 20 per cent by nonmembers.

Study of the distribution of maternal services among the total group of attendants indicates that half of them—or less than one fourth of the total number of physicians in the state—handle about 85 per cent of the births. The other half deliver the remaining one sixth of the babies. Maternal care given by obstetric specialists tends to be concentrated in the large cities; in rural areas this service is mostly in the hands of the general practitioners, especially those who graduated prior to 1915. A very small proportion of women living in rural districts have the services of obstetric specialists.

Antepartum care attaining the level of completeness that is advocated as an ideal standard is received by very few women. With respect to specific details of antepartum service, 13 per cent of the women have no urinalysis during this pregnancy, 16 per cent do not have their blood pressure recorded, 17 per cent have no abdominal examination, 32 per cent are not weighed, 21 per cent do not have the pelvis measured, and approximately two thirds are not known to have a serologic test for syphilis. Classification of antepartum care into broad groups with respect to its relative completeness and adequacy reveals that one fifth of the women receive what may be termed satisfactory care from a practical point of view, while one fifth receive wholly inadequate or essentially no professional antepartum service. Study of the distribution of this care shows a very marked correlation between the level of adequacy of antepartum service and economic status, the size of the city in which the mother lived and her parity. In general, women who are poor or who are on relief, women who live in rural areas and multiparous women bear the brunt of the widespread deficiency in antepartum services.

Nearly one half of the women studied are delivered in hospitals; those living in larger cities, those in the more comfortably situated classes and those having their first baby are more likely to have hospital care than women otherwise classified. Nearly 60 per cent of the mothers living in the larger cities, while less than 25 per cent of the rural women, are delivered in hospitals; according to economic status, hospitalization varies from 65 per cent among the comfortable, 50 per cent

among the moderate, 33 per cent among the poor to 28 per cent among those on relief. The proportion of primiparas hospitalized is nearly double that of multiparas.

Technics employed in the handling of labor and delivery were found to vary widely and to be related to certain characteristics of the birth attendant, to the place of delivery (home or hospital), to the size of the city and to the economic status of the family. If the procedures adopted by specialists in obstetrics are taken to represent standards of good practice, serious defects appear in the practices of many of the birth attendants. The most striking of these consist in the use of solution of posterior pituitary before delivery, in manual dilation of the cervix, in manual removal of the placenta, in the failure to use aseptic technic (sterile drapes and rubber gloves) and in frequent vaginal examinations and use of forceps. Taken as a group, the younger physicians, those who have graduated since 1925, tend to follow with slight variation the practices of the obstetric specialists; physicians who graduated before 1915, and in some instances the doctors of osteopathy, tend to adopt practices which are employed by the obstetricians with relative infrequency. Although questionable, and even dangerous, procedures are spread widely over the total group of parturient women, a relatively large share of the most serious defects in practice fall on poor women, those delivered at home and those living in rural communities.

Postpartum care, measured in terms of postpartum examinations, is given to less than three fourths of the women. The proportion of them receiving such care varies markedly with those factors which influence antepartum and parturient care.

These observations indicate broadly the deficiencies in maternal service as it exists at present in the state of Michigan. On the one hand, they indicate the complexity of the problem with its economic implications; on the other hand, they suggest some of the directions which attempts to improve material service must take.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS APPEARS IN THE STUDENT SECTION, PAGE 1707.

ARIZONA

Refresher Courses.—Dr. John W. Amesse, associate professor of pediatrics, University of Colorado School of Medicine, Denver, and Dr. Wilford W. Barber, Denver, are conducting lectures throughout the state under the auspices of the Arizona Board of Health in cooperation with the state medical association.

ARKANSAS

Personal.—The following have been appointed consultants to the state board of health: Drs. Alexander C. Kirby, pediatrics; Ernest H. White, obstetrics, and Herbert Fay H. Jones, syphilis control. All are of Little Rock.

District Meetings.—The Fifth District Medical Society was addressed in Camden October 6, among others, by Drs. Thomas D. Moore and Robert Lyle Motley, both of Memphis, on "Diagnosis and Treatment of Urinary Infections" and "Kidney Disease: Classification, Diagnosis and Treatment" respectively. Drs. William R. Brooksher and Sidney J. Wolfermann, Fort Smith, secretary and president respectively of the state medical society, also spoke. Dr. Wolfermann addressed the semiannual meeting of the Second District Medical Society in Batesville October 10 on "What Constitutes a Good County Medical Society" and Dr. Alan G. Casort, Little Rock, "Clinical Allergy As You See It."——The Sixth Councilor District Medical Society was addressed at DeQueen September 13 by Drs. George L. Carlisle, Dallas, on "Treatment of the Failing Heart"; George B. Fletcher, Hot Springs National Park, "Mental Depressive Psychoses"; Henry King Wade, Hot Springs National Park, "Urinary Infections"; Charles T. Chamberlain, Fort Smith, "Evaluation of the Systolic Murmur," and Ralph E. Weddington, Fort Smith, "Local Anesthesia in Obstetrics."

CALIFORNIA

University News.—Ground was broken at the University of Southern California, Los Angeles, recently for the new building for biologic research, the gift of G. Allan Hancock. The unit will be three stories high and will contain more than 100 laboratories for research in zoology, botany and related fields.

Graduate Conference in Gynecology.—The committee on graduate activities of the California Medical Association conducted a graduate conference on gynecology in San Diego October 17-20. Lecturers and their subjects included:

Dr. Daniel G. Morton, San Francisco, Menstrual Disorders and Cancer: Cervix and Uterine.
Dr. William B. Thompson, Los Angeles, Pelvic Infections from the Obstetric Aspect.
Dr. Erle Henriksen, Los Angeles, Pelvic Infections from the Gynecologic Aspect.
Dr. Donald G. Tollefson, Los Angeles, Benign Lesions and Uterine Tumors.

DISTRICT OF COLUMBIA

Personal.—Miss I. Malinde Havey, national director of public health nursing and home hygiene for the American Red Cross, died in Boston September 8. Miss Havey was decorated by the British and French governments during the World War for bravery under fire.

Society News.—Dr. Philip E. C. Manson-Bahr of the London School of Tropical Medicine addressed the Academy of Medicine of Washington September 28 on "The Life and Works of Patrick Manson, Father of Tropical Medicine." Dr. Harry H. Donnally paid tribute to Dr. Earl B. McKinley, one of the founders of the academy, who recently was lost on the *Hawaii Clipper*.——At a meeting of the Medical Society of the District of Columbia October 12 a symposium on spotted fever was presented with the following speakers: Drs. Rolla E. Dyer, Ralph D. Lillie, Charles R. L. Halley, Harry A. Ong and Joseph F. Raffetto. Drs. Theodore J. Abernathy and Harry E. Dowling spoke October 19 on pneumonia, a résumé of recent prophylactic measures instituted in the District of Columbia.——Dr. Marvin Pierce Rucker, Richmond, Va., discussed "Toxemias of Pregnancy" before the Washington Gynecological Society October 22.

ILLINOIS

Society News.—The Adams County Medical Society was addressed in Quincy October 10 by Dr. Warren R. Rainey, St. Louis, on "Management of Acute Inflammatory Conditions About the Anus and Rectum."——Dr. Nathaniel G. Alcock, Iowa City, discussed malignancy of the kidney before the Rock Island County Medical Society, September 13, in Moline.——Dr. Lindon Seed, Chicago, discussed "Diseases and Infections About the Floor of the Mouth" before the St. Clair County Medical Society, Belleville, October 6.

Chicago

The Belfield Lecture.—Homer W. Smith, Sc.D., director of the physiologic laboratory, New York University, delivered the tenth annual William T. Belfield memorial lecture before the Chicago Urological Society October 27 on "Physiology of the Kidney."

Branch Meetings.—Dr. Archibald L. Hoyne will address the West Side Branch of the Chicago Medical Society November 18 on contagious diseases.——At a meeting of the Jackson Park Branch October 20 Dr. Robert B. Preble discussed "Trends in Medicine."——A symposium on diseases of the stomach and duodenum was presented before the Calumet Branch October 21 by Drs. Frederic T. Jung, Warren W. Furey, Rudolf Schindler, Fred M. Dreman and Warren H. Cole.——Dr. Cleveland J. White discussed "Diagnosis and Treatment of Demonstrated Skin Cases" before the Northwest Branch October 21.——The Irving Park Branch was addressed October 25 by Drs. Charles H. Parkes on "The Progress of Surgery During the Past Forty Years"; John R. Harger, "Evaluation of Present Surgical Procedures," and John H. Gilmore, "The Candid Camera in Medicine."——Dr. James G. Carr discussed angina pectoris before the South Chicago Branch October 18.——Dr. Arthur E. Hertzler, Halstead, Kan., addressed the Aux Plaines Branch October 28 on "Cardiotoxic Effect of Nongoitrous and Toxic Thyroid."——Drs. Charles A. Doan, Columbus, and Edgar V. Allen, Rochester, Minn., will address the North Side Branch at the Drake Hotel at 8 o'clock November 3 on "Iron Metabolism and the Anemic States" and "Physiologic Effects of Extensive Sympathectomy for Essential Hypertension" respectively.

IOWA

Committee on Industrial Health.—The Iowa State Medical Society has appointed a committee on industrial health. Dr. Edward J. Harnagel, Des Moines, has been named chairman and Drs. Aldis A. Johnson, Council Bluffs, and William C. Goenne, Davenport, are members.

Society News.—Dr. William Malamud, professor of psychiatry, State University of Iowa College of Medicine, Iowa City, conducted a clinic in psychiatry before the Linn County Medical Society in Cedar Rapids October 21. Dr. Marius Nygaard Smith-Petersen, clinical professor of orthopedic surgery, Harvard University Medical School, Boston, discussed fractures of the hips. Dr. Benjamin L. Knight, Cedar Rapids, read a paper entitled "Review of Cancer Work."

Annual Fracture Clinic.—The second annual fracture clinic sponsored by the fracture committee of the Iowa State Medical Society was held in Des Moines October 20. The following participated:

Dr. W. Eugene Wolcott, Des Moines, Arthritis Associated with Fractures.
Dr. Dwight C. Wirtz, Des Moines, Fractures of the Hip, Blind Nailing.
Dr. Lewis M. Overton, Des Moines, Fractures of the Spine—Ambulatory Treatment.
Dr. Douglas N. Gibson, Des Moines, Patellar Injuries.
Dr. J. Albert Key, St. Louis, Emergency Treatment of Compound Fractures.
Dr. James E. M. Thomson, Lincoln, Neb., Fractures of the Forearm.
Dr. Walter D. Abbott, Des Moines, Emergency Treatment of Head Injuries.

MASSACHUSETTS

New England Graduate Assembly.—The first New England Postgraduate Assembly will be held at the Sanders Theater, Harvard University, Cambridge, November 15-16, with the following guest speakers:

Dr. Hubley R. Owen, Philadelphia: What Are the Duties and Responsibilities of the General Practitioner in the Treatment of Fractures? Unrecognized Fractures; Transportation of Injured and Emergency Treatment of Fractures with Special Reference to Fractures of the Long Bones and Fractures of the Spine; Skull Fractures and Concussion.
Dr. Alvah H. Gordon, Montreal: The Physician's Interest in Gallbladder Disease; Mental Complications in Heart Disease; Diagnosis of Diseases with Coincident Enlargement of the Liver and the Spleen.
Dr. Harvey B. Stone, Baltimore: Preoperative and Postoperative Preparation of Surgical Patients; Symptoms and Signs of Intestinal Obstruction.
Dr. Perrin H. Long, Baltimore: Practical Interpretation of Laboratory Bacteriologic and Immunologic Diagnoses in Relation to Infectious Diseases; Clinical Use of Sulfanilamide in the Treatment of Bacterial Infections; Uses of Newer Derivatives of Sulfanilamide in the Treatment of Bacterial Infections.
Dr. Francis G. Blake, New Haven, Conn.: The Value of Antitoxin in Scarlet Fever; The Importance of Time in Serum Therapy.
Dr. Louis A. Buie, Rochester, Minn.: Office Methods of Diagnosis of Anal Diseases; Treatment of Common Anal Diseases.
Dr. Louis H. Nahum, New Haven, Conn.: The Etiology and Treatment of the Cardiac Arrythmias.
Dr. Robert T. Frank, New York: Endocrinology as Now Practiced; The Female Sex Hormones.
Dr. William L. Estes Jr., Bethlehem, Pa.: Acute Traumatic Lesions of the Abdomen; Treatment of Open Wounds and the Use of Antiseptics.
Dr. Benjamin P. Watson, New York: When Is Cesarean Section Necessary and When Is It Unjustified? Treatment of Delayed Labor.

At the dinner Tuesday evening Dr. Warren F. Draper, executive officer of the U. S. Public Health Service, will discuss "Current Phases of the Problem of Medical Care" and Dr. Roger I. Lee, Boston, the private practice of medicine in the present social order. The assembly was authorized at the June meeting of the council of the Massachusetts Medical Society following the recommendation of its committee on graduate instruction. There will be a registration fee of $3.

MICHIGAN

Annual Public Health Conference.—The eighteenth annual session of the Michigan Public Health Conference will be held at the Pantlind Hotel in Grand Rapids November 9-11. General sessions will be held in the Grand Rapids Civic Auditorium. The conference is sponsored jointly by the Michigan Department of Health and the Michigan Public Health Association. Organizations meeting in conjunction with the conference include the Michigan Association of Sanitarians, the State Organization for Public Health Nursing and the Michigan School Health Association.

Society News.—At the opening meeting of the Wayne County Medical Society, Detroit, for the 1938-1939 season, October 3, the speakers were Drs. Henry A. Luce, Detroit, and Thomas R. K. Gruber, Eloise, on the special session of the House of Delegates of the American Medical Association; Charles E. Dutchess, Detroit, the Michigan State Medical Society house of delegates; Louis J. Gariepy, Detroit, on Michigan public health legislation, and Sarah S. Schotten, the medical picture in Europe.——The second Northern Michigan Public Health Conference for the counties of Antrim, Charlevoix, Emmet and Otsego was held October 6; the speakers included Drs. Carleton Dean, Charlevoix; R. Philip Sheets, Traverse City; Loren W. Shaffer, Detroit, and Jerome T. Jerome, Traverse City.——Dr. Loren W. Avery, Chicago, discussed "Diagnostic Significance of the Hemiplegic and Paraplegic Syndrome" before the Calhoun County Medical Society in Battle Creek October 4.

MINNESOTA

New Health District.—Dr. Floyd M. Feldman, for two years head of rural health district 2 in Mankato, has been transferred to Rochester to organize a district health unit. The new unit will be the third established in Minnesota under the state department of health with federal social security funds. Dr. Feldman will be succeeded in Mankato by Dr. Frederick Gunnar Gunlaugson, Minneapolis, formerly epidemiologist of the state department of health. For the past year Dr. Gunlaugson has been studying at the Johns Hopkins University School of Hygiene and Public Health.

Meeting of Radiologists.—The Minnesota Radiological Society held its fall meeting in Rochester October 22. The following, all of Rochester, were among the speakers:

Dr. Charles K. Maytum, Use of X-Rays in the Treatment of Severe Asthma.
Drs. John D. Camp and J. Grafton Love, Intraspinal Protrusion of the Intervertebral Disks.
Dr. John L. Emmett, Value of Urography in the Differential Diagnosis of Obscure Abdominal Lesions.
Dr. John W. Olds, Treatment of Peyronie's Disease Using Radium.
Drs. Harry M. Weber and Charles Allen Good Jr., A Series of Interesting Duodenal Lesions.
Drs. Eugene T. Leddy and John A. L. McCullough, Treatment of Inoperable Carcinoma of the Breast by the Method of Multiple Converging Beams.

Dr. William C. MacCarty, Rochester, gave an address at the banquet on "Something About Specialism and Specialists."

MISSOURI

Health Forum.—Elmer V. McCollum, Ph.D., Baltimore, gave the first lecture in the fall series sponsored by the Jackson County Health Forum in Kansas City October 26; his subject was vitamins. Dr. Arthur T. McCormack, Louisville, also read a paper at this meeting entitled "Some Portions of Health Work." Dr. William W. Bauer, Director, Bureau of Health Education, American Medical Association, Chicago, will discuss "Popular Beliefs in Medicine That Are Not So" November 16 and Dr. Jay Arthur Myers, Minneapolis, December 21, tuberculosis. Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago, will speak March 15. The forum was organized early this year under the auspices of the auxiliaries of the accredited hospitals of Jackson County and is approved by the county medical society.

NEW YORK

Outpatient Department Fifty Years Old.—The Rochester General Hospital, Rochester, celebrated the fiftieth anniversary of the opening of its outpatient department October 21. Dr. Albert C. Snell, for many years chief of staff at the hospital, recalled "Early Days in the O. P. D." and Mr. Ezra Hale, president of the board of directors, spoke on "Importance of the Clinic in the Community Health Program."

State Industrial Meeting.—The annual meeting of the New York State Society of Industrial Medicine will be held in Albany at the Ten Eyck Hotel November 3. The speakers will be:

Mr. William J. Picard, chairman, board of standards and appeals, state department of labor, The Dust Control Problem of the State Department of Labor.
Dr. Leroy U. Gardner, Saranac Lake, The Inhibitory Action of Other Minerals in Association with Silica.
Dr. Richard Kovacs, New York, Physical Therapy in Fracture Treatment.
Dr. Joseph Buchman, New York, A Résumé of the Post-Traumatic Osteoporoses.

Dr. Edgar A. Vander Veer, Albany, is president of the society.

New York City

First Harvey Lecture.—Guy F. Marrian, D.Sc., professor of biochemistry, University of Toronto Faculty of Medicine, Toronto, delivered the first Harvey Lecture of the season October 20 at the New York Academy of Medicine on "Some Aspects of the Intermediary Metabolism of the Steroid Hormones."

Friday Afternoon Lectures at the Academy.—The thirteenth series of Friday afternoon lectures at the New York Academy of Medicine will begin November 18 with a lecture by Dr. Harold T. Hyman on "Recent Advances in Therapeutics." Lectures for coming weeks will be:

December 2, Dr. Frank Fremont-Smith, Influence of Emotional Factors on Physiologic and Pathologic Processes.
December 9, Dr. Alan DeForest Smith, "Sciatic" Pain, Differential Diagnosis and Treatment.
December 16, Dr. Clarence E. de la Chapelle, Management of the Emergencies in Patients with Heart Disease.
Jan. 6, 1939, Dr. Howard Reid Craig, Diagnosis and Treatment of Some Diseases of the Newborn Infant.
Jan. 13, 1939, Dr. Walter C. Alvarez, Rochester, Minn., Functional Digestive Disturbances.

Therapeutic Use of Gases at World's Fair.—A division of pneumatology has been created by the New York World's Fair to direct the therapeutic use of gases as they are employed for the relief of pain (anesthesia), the saving of life (resuscitation) and clinical disease (oxygen therapy). The department will function in the double capacity of caring for visitors and as a practical demonstration of the most modern methods employed in this field, which may be studied by institutional and municipal groups. Suitable equipment will be provided to care for the following hazards: asphyxia from gases, drugs, submersion, fire fighting, foreign body obstruction, tumors within the airway, electrocution, strangulation, allergy, pressure due to moving objects, collapse of buildings, poisonous gases in manholes and premature asphyxia neonatorum. The Society for the Prevention of Asphyxial Death, Inc., is cooperating in the organization and development of this work.

OHIO

Annual Graduate Day in Toledo.—The Medical Institute of the University of Toledo presented its fifth annual Graduate Day October 28 at the university. The guest lecturers were Drs. John A. Toomey, Cleveland, on "Treatment of Meningeal Irritations," "Evaluation of Specific Vaccines and Serums in Prophylaxis and Treatment of Contagious Diseases" and "Management of Acute Contagious Diseases and Their Complications," and Louis E. Phaneuf, Boston, on "Significance of Menorrhagia and Metrorrhagia," "Pelvic Infection in Women" and "Management of Uterine Prolapse."

PENNSYLVANIA

State Medical Election.—Dr. Charles H. Henninger, Pittsburgh, was named president-elect of the Medical Society of the State of Pennsylvania at the annual meeting in Scranton October 3-6. The following were elected vice presidents: Drs. Arthur E. Davis, Scranton; John B. F. Wyant, Kittanning; Walter J. Stein, Ardmore, and Arthur B. Fleming, Tamaqua. Dr. David W. Thomas, Lock Haven, became president. The 1939 session will be in Pittsburgh.

Society News.—Dr. Albert F. Doyle, Johnstown, assistant director, division of syphilis and genito-infectious diseases, state department of health, addressed the Butler County Medical Society September 13 on "The Duties of Physicians Treating Syphilis."——Dr. James L. Gilmore, Pittsburgh, addressed the Washington County Medical Society, Washington, September 14, on "Obstetrics for the General Practitioner."——At a meeting of the Westmoreland County Medical Society in Latrobe September 20 the speakers included Drs. Thomas St. Clair, Latrobe, and John F. Blair, Derry, on "Management of Buruitis" and "Management of Common Skin Conditions" respectively.——Dr. Robert C. Simpson, Ridgway, addressed the Elk County Medical Society July 12 on the mechanism of the electrocardiogram.

Philadelphia

Alvarenga Prize Competition.—The College of Physicians of Philadelphia announces that the Alvarenga Prize for 1939 will be awarded July 14, 1939, to the author of the best memorial or the best unpublished essay on any branch of medicine that may be deemed worthy. The committee will consider recent publications or unpublished typewritten manuscripts submitted to the committee before May 1. Manuscripts not in English must be accompanied by a translation in English. Address communications to the Alvarenga Prize Committee, 19 South Twenty-Second Street, Philadelphia.

Society News.—Among speakers before the Philadelphia Pediatric Society October 11 were Drs. Jacob B. Feldman on "Vitamin D Deficiency Related to the Eye" and Rutherford L. John, "Some Aspects of Osteochondritis Juvenilis."——Dr. Gerald H. J. Pearson, among others, addressed the Philadelphia Psychiatric Society October 14 on "The Chronically Aggressive Child."——A symposium on allergy will be presented during the winter before all the branch societies of the Philadelphia County Medical Society, as follows: Drs. Richard A. Kern, "General Principles of Allergy and Its Clinical Manifestations"; Louis Tuft, "Principles of Diagnosis and Treatment: Allergic Methods"; James Alexander Clarke, "Bronchial Asthma," and Harry B. Wilmer, "Hay Fever and Other Allergies."——Drs. Bernard J. Alpers and Pascal F. Lucchesi addressed the Philadelphia County Medical Society October 19 on "Etiology and Pathology of Poliomyelitis" and "Treatment of Poliomyelitis" respectively.——Dr. Jesse G. M. Bullowa, New York, among others, addressed the Northern Medical Association of Philadelphia October 17 on "The Pneumonias."

VERMONT

State Medical Meeting and Election.—Dr. Edwin A. Hyatt, St. Albans, was elected president of the Vermont State Medical Society at its annual meeting in Burlington October 6. Dr. Angus C. Black, Brattleboro, was elected vice president and Dr. Benjamin F. Cook, Rutland, secretary. The 1939 convention will also be held in Burlington. The guest speakers were:

Dr. Alexander D. Langmuir, Albany, N. Y., Serum Treatment of Pneumonia.
Dr. Wright Clarkson, Petersburg, Va., Carcinoma of the Cervix Uteri.
Dr. Philip J. Howard, Detroit, Convulsions in Infancy and Childhood.
Mr. R. F. Cahalane, director, Associated Hospital Service, Boston, Group Hospitalization.

Friday morning October 7 a symposium on the gallbladder was presented by Drs. Alvah H. Gordon, Ralph R. Fitzgerald, Charles K. P. Henry and Joseph E. Pritchard, all of Montreal, Canada. In the afternoon a fracture demonstration was presented by the Vermont fracture committee of the American College of Surgeons, with Dr. Fred H. Albee, New York, as the guest speaker on "Destruction of the Blood Supply and Its Restoration in Fractures of the Hip."

VIRGINIA

Medical College Bequeathed One Million Dollars.—The Medical College of Virginia has received a bequest of securities valued at more than a million dollars from the estate of the late Mrs. Bettie Davis Wood. The gift will be added to the endowment funds of the college and used for general purposes. It will be known as the Judd B. Wood and Bettie Davis Wood Memorial, named for the late Dr. Wood, a Richmond dentist, and his wife.

State Medical Election.—Dr. Hugh H. Trout, Roanoke, was named president-elect of the Medical Society of Virginia at its annual meeting in Danville October 5. Drs. Perry W. Miles, Danville, and Samuel B. Moore, Alexandria, were elected vice presidents and Miss Agnes Edwards, Richmond, was reelected secretary-treasurer. Dr. Alex F. Robertson Jr., Staunton, was installed in the presidency, succeeding Dr. George F. Simpson, Purcellville. Richmond was chosen as the convention city in 1939.

WISCONSIN

Society News.—Dr. John D. Steele Jr. addressed the Milwaukee Academy of Medicine October 18 on "Management of Postoperative Pulmonary Complications with Special Reference to the Use of Intratracheal Suction." Dr. Samuel G. Higgins showed motion pictures of the work of medical missionaries in India.——Dr. Karl A. Menninger, Topeka, Kan., addressed the Medical Society of Milwaukee County, October 14, on "Psychiatric Problems in General Practice."

CANAL ZONE

Quarantine Against Yellow Fever.—The New York *Times* reported that a quarantine against yellow fever for passengers from Caribbean ports had been established in Balboa October 3. The action was taken following the death in Guadaloupe of the cook of a ship that had called at Venezuelan ports, although the point of infection had not been determined at the time of the report. The quarantine requires that passengers arriving by ship or plane have their temperatures taken daily for six days after leaving their last Caribbean port. Persons who have been vaccinated against yellow fever or who have recovered from it are exempted. This procedure supersedes the quarantine of ships' crews and passengers for six days for observation, it was stated.

GENERAL

Beware of Bogus Agent.—A hotel in Spencer, Iowa, has reported that a man giving the name A. J. Sutherland recently induced the hotel to cash a check for $12.50 by claiming to sell publications of the American Medical Association. The man gave his address as 222 Fourth Street S.E., Cedar Rapids, Iowa, and claimed that he had just sold medical publications to the superintendent of a Spencer hospital. Accredited representatives of the American Medical Association are provided with credentials signed by Dr. Olin West, Secretary and General Manager.

Ike Luckman Wanted by Police.—The police department of the city of New York requests the cooperation of physicians in apprehending one Ike Luckman, charged with bribery and conspiracy. Luckman is 53 years of age and answers the following description: height, 5 feet 6 inches; weight, 200 pounds; brown eyes and hair; wears eye glasses, no rims; face slightly pockmarked; speaks Yiddish and English, and is neatly dressed. This man has diabetes and is believed to be a user of insulin. The police request that when located he be held as a fugitive from justice and the detective division of the department be advised by wire.

Railway Surgeons' Meeting.—The forty-ninth annual Congress of Railway Surgeons was held in Chicago at the Palmer House September 19-21. Among the speakers on the program were:

Dr. John R. Nilsson, Omaha, Transportation and Treatment of Fractures.
Dr. Roy W. Scott, Cleveland, Clinical Aspects of Cardiovascular Disease.
Drs. Chevalier Jackson and Chevalier Lawrence Jackson, Philadelphia, Trauma of the Larynx.
Dr. Dean D. Lewis, Baltimore, Nerve and Muscle Injuries.
Dr. George F. O'Brien, Chicago, Pneumonia in Industry.
Dr. Austin A. Hayden, Chicago, Conservation of Hearing.
Dr. Vilray P. Blair, St. Louis, Acute Injuries of the Face.

Officers elected were Drs. Mathew A. Tinley, Council Bluffs, Iowa, president; Glenn I. Jones, Washington, D. C., Calvin A. Walker, San Francisco, and Leonard A. Ensminger, Indianapolis, vice presidents, and Daniel B. Moss, Chicago, secretary, reelected.

Fellowships for Cancer Research.—The Finney-Howell Research Foundation, Inc., announces that all applications for fellowships for next year must be filed in the office of the foundation, 1211 Cathedral Street, Baltimore, by January 1. Applications received after that date cannot be considered for 1939 awards, which will be made March 1, 1939. The foundation was provided for in the will of the late Dr. George Walker, Baltimore, for the support of "research work into the cause or causes and the treatment of cancer." The will directed that the surplus income from the assets of the foundation together with the principal sum should be expended within a period of ten years to support a number of fellowships in cancer research, each with an annual stipend of $2,000 "in such universities, laboratories and other institutions, wherever situated, as may be approved by the board of directors." Ten fellowships were awarded in 1938.

Mortality Statistics for 1937.—The U. S. Bureau of the Census recently reported that the provisional crude death rate for 1937, as shown by death certificates received from state departments of health, was 11.2, as compared with the rate of 11.5 for 1936. The lowest rate ever recorded was 10.7 in 1933. There were 1,450,715 deaths, a decrease of 28,513 from the previous year. Thirty-three states and the District of Columbia showed decreases, six states showed no change and nine showed increases in rates. The highest rates were Arizona 16.8, New Mexico 15.2, District of Columbia 13.9 and Maine 13.4. The lowest rates were North Dakota 7.7, Oklahoma 8.4, South Dakota 8.6 and Arkansas 9. The bureau points out that differences in crude rates do not necessarily indicate corresponding differences in health conditions. Areas do not all have the same age, sex and racial distributions of the population and these factors, among others, partly determine the death rate.

WPA Publishes Index of Research Projects.—About 2,000 research projects carried on as part of the federal work relief program have been summarized briefly in an index and digest published by the Works Progress Administration, a volume of 291 pages. A concise statement of the conclusions of each study and an alphabetical index are included. Reports of these projects touch on nearly every field of natural and social science and many of them have appeared in scholarly journals in the form of articles. Many, however, are still in manuscript form and arrangements have been made with the American Documentation Institute whereby microfilm copies of the original reports will be furnished at nominal rates to research specialists. A small edition of the index volume has been prepared for distribution to libraries, government departments, industrial concerns and research foundations. A limited supply is still available, the administration announces. Requests should be addressed to the Works Progress Administration, 1734 New York Avenue N.W., Washington, D. C.

Special Society Election and Council Actions.—The American Academy of Ophthalmology and Otolaryngology at its annual meeting in Washington, D. C., October 9-14, adopted a resolution expressing its "unqualified approval of those considerations relative to the national health program adopted by the House of Delegates of the American Medical Association in its special session held September 16-17." The academy also recommended to the appropriate governmental agencies that a nationwide vision and hearing survey of school children in the United States, incorporating necessary remedial measures, be undertaken. For such a survey the academy offered its technical and advisory services. Dr. Albert C. Snell, Rochester, N. Y., was chosen president-elect of the academy. Dr. George M. Coates, Philadelphia, will take office as president January 1. Vice presidents elected were Drs. William W. Pearson, Des Moines, Iowa; William J. Mellinger, Santa Barbara, Calif., and Charles A. Bahn, New Orleans. Dr. William P. Wherry, Omaha, was reelected executive secretary-treasurer and Dr. Secord H. Large, Cleveland, comptroller. The 1939 meeting will be in Chicago.

Changes in Status of Licensure.—The Massachusetts Department of Registration announces the following action:

Dr. David H. Shulman, Boston, license revoked August 18 because of gross professional misconduct in connection with the care of a premature termination of pregnancy.

The California State Board of Medical Examiners reports the following:

Dr. James H. Beggs, Idyllwild, Calif., license restored March 7.
Dr. Ralph A. Behread, Keene, Calif., license restored March 8; placed on probation five years without narcotic privileges.
Dr. John V. Cocke, Los Angeles, license restored March 9; placed on probation five years without narcotic privileges and prohibition against indulgence in alcoholic or intoxicating liquors.
Dr. Arthur Lee Davis, Los Angeles, license restored March 9; placed on probation five years without narcotic privileges.
Dr. Thomas Flint Jr., San Francisco, license restored March 9; placed on probation five years without narcotic privileges.
Dr. George W. Fuller, formerly of Pasadena, Calif., license restored March 8; placed on probation five years.
Dr. Ernest D. Weaver, Los Angeles, license restored March 9; placed on probation five years without narcotic privileges.
Dr. Sharon M. Atkins, Los Angeles, license revoked March 9, for unprofessional conduct.
Dr. John Elmer Baker, Los Angeles, license revoked March 10, for conviction on an insurance fraud.
Dr. Paul F. A. Eid, Burlingame, license revoked March 10 for his conviction of a crime involving moral turpitude.
Dr. Oscar C. Long, Brawley, Calif., license revoked March 10 for federal narcotic conviction.
Dr. Frank Adrian Pearl, Los Angeles, license revoked March 10, for his conviction of an insurance fraud.

The Delaware state board reports:

Dr. Frank R. Palmer, Wilmington, license revoked June 22 for performing an illegal operation which resulted fatally.

The Michigan State Board of Registration announces the following action:

Dr. Leo Charles Donnelly, Detroit, license revoked June 16 for unprofessional advertising.

The Minnesota State Board of Medical Examiners reports the following:

Dr. Nels G. Mortensen, St. Paul, license revoked July 16 for two years; he was found guilty of "immoral, dishonorable and unprofessional conduct" and specifically with "procuring, aiding and abetting a criminal abortion."

FOREIGN

Congress of Comparative Pathology.—The fourth International Congress of Comparative Pathology, to be held in Rome May 15-20, 1939, will have three sections, it was recently announced. They will be human medicine, veterinary medicine and phytopathology. Papers submitted to any section must be related to the main topic and be as concise as possible. A summary of about 100 words should also accompany the papers, which must be submitted by March 31, 1939. Among those listed to take part in the discussions are Wendell M. Stanley, Ph.D., Princeton, N. J.; Sir Aldo Castellani, Rome, and Prof. G. Ramon, Paris.

Deaths in Other Countries

Dr. Karl Sudhoff, for years professor of the history of medicine at the University of Leipzig, died in Salzwedel, Germany, October 14, aged 84.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 8, 1938.

"Patent Medicines"

A small book entitled "Patent Medicines" has been published by Dr. A. J. Clark, professor of pharmacology and materia medica in the University of Edinburgh. Professor Clark points out that the term "patent medicine" is a misnomer. In the first place the majority of preparations so called are secret remedies, and in the second place a chemical substance cannot be patented, although the process by which it is made can be thus protected. So-called "patent medicines" are simply substances or mixtures sold under proprietary names ranging from valuable remedies to the most impudent frauds advertised to the public. The annual trade in "patent medicines" has been estimated at $100,000,000, which is nearly equal to the cost of hospital services and is between twice and thrice the cost of drugs prescribed by physicians.

THE PRESS AND NOSTRUMS

Advertisements of nostrums is a conspicuous feature of the press. About one sixth of the advertising space is devoted to them. The Statistical Review of Press Advertising noted in 1936 that eight firms which advertised remedies for nervous or digestive disorders spent $5,000,000 on press advertisements. A company which advertises a brand of acetylsalicylic acid stated in a trade journal that during the winter of 1937-1938 it proposed to spend $500,000 in 300 papers. In the last ten years Professor Clark has observed a steady and considerable increase in the space occupied by such advertisements in the press. In the report of the committee appointed by the government to inquire into the trade in "patent medicines" it is stated that the large sums received from advertisements lead papers to exclude criticism of secret remedies. When the British Medical Association issued its volume entitled "Secret Remedies," containing analyses and costs, not only was it not noticed editorially by most papers but even an advertisement of it was declined by many, some of them of the highest class. A trial in which the judge described the business of the proprietors of a secret remedy as "based on unblushing falsehood" was with few exceptions not reported in the press. The control of the press is given by Professor Clark as the obvious reason why Parliament has refused for a quarter of a century to attempt to remedy the disgraceful abuses revealed by its committee. The press controls the politicians, and the trade associations control the press.

The medical press is not exempt from Professor Clark's criticisms. The committee mentioned considered that "adequate censorship had not in all cases been exercised, as indeed was admitted by Dr. Cox, the representative of the British Medical Association." The use of proprietaries by the profession Professor Clark describes as a subject which presents numerous difficulties, because such remedies form a continuous series, varying from some of the most valuable drugs to the lowest class of secret remedies. Yet in general the profession is opposed to secret remedies. Its critics say that this is due to fear of competition, but they ignore the fact that these remedies cause more disease than they cure. Professor Clark says that it is clear that the profession can be influenced by advertisements as easily as any other portion of the community. This is proved by the steady increase of drugs prescribed under a proprietary name, which now constitute 30 per cent of all the drugs prescribed. Only a small fraction are represented by drugs obtainable only under a proprietary brand; the majority have nonproprietary equivalents equally good and much cheaper. The drug firms have discovered the susceptibility of the profession to advertisements and that if a proprietary name can be fixed in the mind of the physician he can be induced to prescribe it under this name although he could get it for a fourth of the price under a nonproprietary name. This susceptibility has led some venders to discover that a good way to establish a new remedy is to advertise it first to the profession. Such advertisement is relatively cheap. If physicians can be induced to use it and even to furnish testimonials, the vender can then advertise to the public direct and expand his claims in any way that seems profitable. Thus a remedy which has been accepted by the medical press as a simple disinfectant or cough cure may later be advertised to the public as a cure for consumption that has been endorsed by the medical profession.

LEGISLATION

Though nothing has so far been done to check fraudulent advertising, recent legislation has imposed certain limitations. The advertising of treatment for venereal diseases has been prohibited since the establishment of state clinics. The sale of drugs liable to produce addiction, such as morphine, heroin and cocaine, is forbidden except with a medical prescription. The Therapeutic Substances Act regulates the advertisement, manufacture and sale of certain remedies, such as insulin, vaccines and serums. These cannot be sold as secret remedies. The Poisons Act (1934) prohibits the sale of certain dangerous drugs, for example the barbiturates, dinitrophenol and aminopyrine, except with a medical prescription. Objectionable advertisements, such as those advertising abortifacients as "remedies for female weakness," have become rare, and so have those of cures for consumption and cancer. The Publicity Club of London, which represents important advertising interests, has created machinery for the examination of advertisements of an undesirable type, and many of the more reputable journals follow the advice given. However, remedies for the cure of epilepsy and Bright's disease still appear in some journals with large circulation, and it might be said that the public is being swindled in a somewhat more skilful manner.

Women Physicians

Delivering an address at the opening of the session of the London School of Medicine for Women, Lord Horder said that he would not attempt to define the differences, physical, intellectual and emotional, between women and men. The attempts to define them on the intellectual and emotional side had never been very sucessful, even in the hands of psychologists and biologists. But biologically was it not a fact that "there are no men and no women but only 'sexual majorities'?" He believed that a good man physician had a little more of the feminine in him than the average man, and that a like statement applied to a good woman physician. Originality might be more common in men, but women had more intuition, more conscience, more curiosity (a trait essential to research workers) and more industry. The last might be their undoing if they read too much and did not have time to observe and think.

Lord Horder believed that physicians who possessed what is called clinical instinct owed it not to a sixth sense but to making observations of which they were unconscious and effecting a synthesis of those that were causatively associated and discarding those that were not. He exhorted his audience to train themselves to recognize the average, so that their attention would be struck by any deviation from it, which should be assumed to be pathologic until proved to be otherwise. Many patients needed the spiritual sensitivity which women possessed to a higher degree than men. He thought that in respect to natural faculties women and men stood about fifty-fifty in their capacity to make good physicians. It was the woman in the physician that medicine wanted just as much as the physician in the woman.

PARIS

(From Our Regular Correspondent)

Sept. 29, 1938.

War Scare Compels Postponement of Meetings

Many important national medical meetings are held annually during the early autumn. Owing to the recent threat of another world war, it has been deemed advisable to postpone the following meetings: French Medical Congress, which was to be held September 26 at Marseilles, postponed to November 10; Hygiene Congress, which was to meet October 3 at the Pasteur Institute of Paris, no date set; Congress of French Electroradiologists, which was to be held October 5 at Paris, no date set; French surgical and urologic congresses, which were to be held October 3 at Paris, no date set; French Pediatric Congress, which was to be held October 6 at Paris, no date set.

Surgical Treatment of Hypertension

An abstract of papers on the surgical treatment of hypertension read at the recent meeting of the International Surgical Society appeared in the September 28 issue of the *Presse médicale*.

The first report was presented by Professor Pende of Rome, who stated that in 1924 he had suggested resection of the splanchnic nerves and experimental study and since that date had demonstrated a marked diminution in the secretion of epinephrine and a dilatation of the abdominal vessels following such an operation. Possibly, but only theoretically so far, division of the left splanchnic nerves has an influence on the reflexes which appear to govern, to a certain degree, spasmodic hypertension. One ought, however, to make the deduction that because these changes take place in a normal animal they should also occur in a patient with hypertension. The author limits resection of the left splanchnic to cases of juvenile or presenile hypertension in which one fails to find any evidence of renal insufficiency or advanced cardiovascular changes. Even a blood urea retention of 0.5 Gm. is a contraindication to operation. On the other hand, certain serious symptoms, such as those of acute cortical or retinal character and local asphyxia, appear to have no influence on the success of an operative result. The left adrenal should be inspected lest a neoplasm be overlooked, and, in addition, it is indispensable just before an operation to carry out a paravertebral infiltration of the left splanchnic nerves with procaine hydrochloride to see whether there is a drop in the blood pressure. If a drop does not occur after two or three such tests, operative intervention should be refused, because it is almost sure to be unsuccessful. An analysis of published cases shows that no deaths have occurred and that a rapid cure follows.

The second paper on the physiopathology of hypertension from the surgical standpoint was read by Professor Wertheimer of Lyons, who pointed out that experimental observations show that all resections of the sympathetic nerves are followed by a hypotension which is only transitory. The regulation of blood pressure is governed in an automatic manner by an interaction of reflexes of cardio-aortic and carotid sinus origin. Experimentally produced hypertension in animals can be modified only by total resection of the thoraco-abdominal sympathetic nerves. It appears probable that such experimental hypertension can be compared to the condition encountered clinically. Neither the results of experimental work nor clinical or surgical observations have given an acceptable explanation of hypertension. It seems plausible to ascribe several different causes. Clinically, lead poisoning, emotional disturbances or eclampsia can give rise to hypertension. In addition one might mention blocking of the cerebral ventricles, serous meningitis of the posterior cerebral fossa, certain major amputations and section of important nerve trunks. The question arises whether a patient with hypertension should be operated on. One must in the first place exclude patients who have a preexisting cardiovascular or renal lesion, thus leaving as sole indications paroxysmal hypertension and the apparently primary permanent type of hypertension in young adults or middle aged persons before serious changes have taken place in the heart, vessels and kidneys.

The third paper, on the operative indications and results, was by Professor Alessandri and Dr. Valdoni of Rome. They agreed with the previous speakers that only patients should be considered who are without evidence of organic visceral changes, who have not been benefited by prolonged medical treatment and in whom one can be certain that the hypertension is not secondary to chronic interstitial nephritis. The most favorable cases are those of the pure juvenile forms without renal or vascular sclerosis. Diabetes and obesity per se are not contraindications. One should limit operative intervention to a single type of procedure, but they prefer alcoholization of the splanchnic nerve followed later, if there is an amelioration, by resection of the left splanchnic nerves.

A fourth paper was read by Dr. Peet of Ann Arbor, Mich., who believes that hypertension is of nervous origin and that resection of the splanchnic nerves is therefore the operation of choice. He prefers, however, a bilateral resection as opposed to the unilateral type of Pende. During the past five years he had operated in 375 cases, resecting about 12 cm. of the nerves between the ninth rib and the diaphragm. In addition he had removed the tenth and eleventh dorsal ganglions and occasionally also the twelfth. In about half of the cases there had been a distinct and permanent lowering of the blood pressure. In addition, a marked improvement had been noted in the condition of the eyes, heart and kidneys. Complete recovery follows about 15 per cent of the operations.

The discussion was opened by Professor Heymans of Ghent, Belgium, who reported that he had been able in dogs to cause the blood pressure to rise to 300 mm. of mercury by section of the depressor nerves arising from the carotid sinus, but this did not take place if the animal had been subjected previously to a complete paravertebral sympathectomy. He believes either that hypertension is of nervous origin or that the operations so far undertaken for its relief have given rise to a spasm of the renal vessels.

Dr. Waltman Walters presented the results obtained at the Mayo Clinic in collaboration with Drs. Adson and Barker. There had been only one death in 311 operations on 156 patients. The most reliable sign of improvement is the recession of the sclerosis of the retinal arteries, and such an amelioration was found on later examination in 131 of the 155 cases. If marked sclerosis exists before operation, the prognosis is not very favorable. Three patients with adrenal medullary tumor as the source of their hypertension have been cured. Of seven patients with a cortical adrenal tumor, five had hypertension and the pressure dropped to normal levels after operation. In a patient with a malignant adrenal tumor, recurrence was accompanied by hypertension. Sympathectomy is indicated if there is no evidence of sclerosis of the retinal arteries and no localized renal disease, adrenal tumor or toxic or infectious factor. Functional cure will follow 83 per cent of the operations.

Dr. Fontaine of Strasbourg cited the results of nineteen operations by Professor Leriche and added four personal observations. Excellent results have been obtained both by adrenalectomy and by unilateral or bilateral resection of the splanchnic nerves; to the latter operation the removal of the first lumbar ganglion is added.

Professor Chevassu New Head of Urologic Department

The vacancy created as the result of Prof. Georges Marion's having reached the age limit has been filled by the appointment of Prof. Maurice Chevassu. The latter thus becomes professor

and head of the department of urology in the Faculté de médecine (medical school of the University of Paris). Professor Chevassu's clinic at the Cochin Hospital has been visited by many American urologists, and his many contributions to the literature of urology have made his work familiar to urologists all over the world.

A Curie Postage Stamp

A new postage stamp, of a denomination corresponding to the 5 cent American stamp, has been issued in honor of the discoverers of radium, Professor and Madame Curie. It is being sold with a slight additional tax, which is destined to aid the work of the International Union against Cancer, whose meeting will be held shortly in connection with the anticancer week.

BERLIN

(From Our Regular Correspondent)

Sept. 17, 1938.

The Decline of Consanguineous Marriages

Prof. Dr. Fritz Lenz, Berlin ordinarius, recently published in *Erbarzt* a report on the incidence of consanguineous marriages. Medical geneticists regard such marriages as dangerous because of the frequent exaggeration of the transmitted recessive pathologic characters. Moreover, such marriages are of importance to research on defective heredity. The problem is approached in the following manner: The records of a large number of cases of a particular disorder, deaf-mutism for example, are assembled, and determination is made of the percentage of consanguineous marriages which have taken place in the ascendencies. To make sure that this percentage is greater than the incidence of consanguineous marriages in the population as a whole, one must be conversant with the latter figure. But the incidence in the population will differ at various times, in various localities and in various groups. Acceptable, useful statistics are available from Prussia, where, since 1875, the marriage registries have kept routine records of all marriages contracted between first cousins, uncles and nieces, and aunts and nephews. The percentages of such marriages to the total number registered in the various decades are shown in the accompanying table.

Consanguineous Marriages in Prussia

Decade	Percentage
1875-1884	0.78
1885-1894	0.62
1895-1904	0.48
1905-1914	0.43
1915-1924	0.30
1925-1934	0.17

In the years 1934, 1935 and 1936 the corresponding percentage remained 0.11. Accordingly, in six decades the incidence of marriages between blood relations has greatly decreased. As the principal cause of this trend, Lenz cites the migrations of the population within the reich as well as the greater concentrations of people in large cities and industrial centers. In the urban community kinfolk tend to drift apart or lose track of one another much more readily than in the country. Another important factor is decreased natality. During the seventies the average number of births per marriage was five; in the last decade it was only two. At the rate of five births per marriage every male citizen would have on an average twenty female first cousins, one of whom he might eventually marry; but if an average of only two children result from a marriage, the corresponding figure is two instead of twenty. The probability of marriage among blood relations has therefore decreased in the course of six decades much more rapidly than the birth rate. On the other hand, the incidence of marriages between more distant relations will not decrease as rapidly as the incidence of marriages between the nearer of kin. The common ancestors of second and even more distant cousins belong one or more generations further back in the ascendency. Accordingly, the decline in the birth rate, which first became substantial around the turn of the century, can have exerted scarcely any influence on the incidence of marriages between more distant relatives, although it has already influenced to a certain extent the incidence of the more consanguineous unions. Marriages of first cousins outnumber the marriages of other near relatives by about 10:1.

If one wishes to evaluate the percentage of such marriages in the parentage of a particular group of sick persons, one must compare the figures with the average percentage for the decade during which the parents in question were married (by reference to the figures quoted by Lenz). Knowledge of these statistics is likewise valuable for the prognosis of the incidence of recessive hereditary disorders. As about one third of all deaf-mutes are children of consanguineous marriages, a recession in the incidence of such unions would be accompanied by a substantial decline in the incidence of deaf-mutism. The decreased incidence of this condition is of course based also on a decrease in the morbidity of meningitis, scarlatina and syphilis. Lenz states further that the majority of recessive hereditary disorders are found not in the progeny of close blood relations but in that of more distant relatives, even in the offspring of parents who are themselves unaware of any kinship yet come from the same community or from the same rural group. Since marriages of more distant relatives tend to decrease in frequency much less rapidly than marriages of near relatives, the decline in the incidence of congenital defects transmitted by the former will progress at a slower pace than those transmitted by the latter. At all events, the decreasing incidence of consanguineous marriages should be considered an important factor in the decline of recessive hereditary disorders.

More About the Exclusion of Jewish Physicians

To the new decree by which the licenses of all Jewish physicians are revoked, several additional rules and stipulations have been appended. As already reported, a certain number of Jews will still be issued special permits to practice in the Jewish community, but only in the biggest cities, such as Berlin and Vienna, which contain a large Jewish population. In Berlin, for example, 200 Jewish physicians will be allowed to remain in practice after September 30, in order, as officially stated, to prevent a rush of Jewish patients to the Aryan practitioners. The special permits issued to Jewish physicians will by no means approximate the regular license (approbation) but will be in the nature of temporary authorization to practice medicine. These Jewish practitioners will even be officially designated not as "physicians" (aerzte) but as "treaters of the sick" (krankenbehandler). The latter is a term recently used by Privy Councilor Dr. Conti, director of the central municipal health bureau of Berlin and a powerful Nazi influence in medical affairs. The residences of Jewish doctors who remain in practice must be identifiable by special legends. It is stipulated that in cities (except Berlin and Vienna) which contain Jewish hospitals no Jew may engage in outside practice. Among places in which this rule will be enforced are Hamburg, Cologne, Frankfort on the Main and Breslau, although all these cities have large Jewish populations. Whether this regulation will remain long in force cannot at present be stated. Permits to practice certain specialties not represented in the Jewish hospitals may be issued to Jewish physicians in the localities affected.

In future Jewish patients may be admitted only to Jewish clinics and hospitals or to those institutions which, as Dr. Conti phrases it, "because of their sectarian character remain in downright ignorance of racial and national questions." This last reference is to certain non-Jewish sectarian hospitals and other hospitals under private charitable direction. Despite numerous declarations to the contrary, the expulsion of Jewish physicians, as already reported, bids fair to produce an acute shortage of

practitioners. This is evidenced by a notice that appeared late in August in the Berlin *Abendblatt*, a Nazi party organ, to the effect that a temporary lack existed in the medical service available to Berliners, especially in six areas in the northern, eastern and southern sections of the city inhabited by the lower income groups of the population. A landlord can now on short notice break a lease with a Jewish physician who is being forced out of practice. The same issue of the newspaper also carried a stern and emphatic warning to all landlords in question against failure to take advantage of this opportunity to get rid of their Jewish tenants within a reasonable time and to reserve the vacated premises for new non-Jewish practitioners.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 1, 1938.

Examination of Men Exposed to Lead

Criticisms of the estimation of the ratio of large to small lymphocytes as a practical laboratory method in the examination of men exposed to lead and of the common method of estimating the strength of the hand grip were advanced recently by Dr. L. A. Windsor-McLean, chairman of the medical (lead poisoning) board, Mount Isa Mines, Queensland. The criticism concerning the former method was that if a division of the lymphocytes is made merely on a consideration of absolute size (e. g. 10 micromillimeters) too many uncontrollable factors are involved for the estimation to be of general use. The spreading of the blood film makes a vast difference in the apparent size of all the blood cells, and even on one film the ratio of large to small lymphocytes was found to vary as much as from 9 in a thin portion of the smear to 1.1 in a thick portion. Also, contrary to the opinion that the strength of the hand grip is the most generally useful test in the search for lead poisoning, it is felt by Dr. Windsor-McLean that the test is thoroughly unreliable, at least as far as estimating the strength of the hand grip by using a Collins type dynamometer is concerned. He considers that there is no guaranty that the subject is using the maximum effort of which he is capable and cites the case of a man applying for compensation. Apart from this subjective aspect of the readings, he considers that in many cases the maximum reading is determined by the pain produced by the instrument rather than by muscular strength. Finally, a definite knack may be acquired whereby, as a result of a sudden squeeze, a momentarily high reading may be obtained.

DARK FIELD EXAMINATION FOR POLYCHROMASIA

In view of Lane's dictum that after exposure to lead and before the appearance of stippled cells in the blood a high polychrome count is frequently the only change found, an original method of examination for polychromasia with dark field illumination has been described. Ordinary thin blood films are made, dried and fixed and then treated with Sellers's stain. In a microscopic examination with a "cardiod" dark ground condenser, the ordinary orthochromatic cells show up as yellow rings, while the polychromatic cells are pink to reddish pink rings. The fact that these pink cells actually correspond to the polychromatic cells has been amply verified. It is contended that with practice one can pick out the polychromatic cells, like the stippled cells, more readily in the dark field and that a dark field is certainly much easier on the eyes of any one who must do large numbers of counts during a day.

Research in New Zealand

Under the provision of the health act, the New Zealand government has established a medical research council, all the members of which are physicians with the exception of the director general of scientific and industrial research. A statutory function of the health department is to promote or carry out researches and investigations in matters concerning the public health and the prevention or treatment of disease. This council will act solely in an advisory capacity to the minister of health and will not control expenditure. Committees will be appointed as part of the organization to supervise each investigation, and adequate funds will be provided by the government. Preliminary research work has already been done under the auspices of the department of health. Subjects for present and future investigation include nutrition, tuberculosis, goiter, dental caries, hydatid disease, cancer and undulant fever. Since 1924 the government has provided only £13,239 for medical research in New Zealand, and payments have been intermittent. This recent move gives promise of medical research on a more definite and liberal plan, coordinated with similar work being done in England and Australia.

Consumption of Dangerous Drugs

On a per capita basis, the consumption of heroin, morphine and cocaine in Australia is much higher than the world average. The League of Nations report for 1936 showed that Australia consumed 7.5 per cent of the heroin and 14 per cent of the morphine accounted for. The accompanying table indicates the consumption in kilograms per million of inhabitants for the years 1931 and 1934. The figures show that morphine and heroin are used four times as extensively in Australia as in Great Britain and that, although the American figure for morphine is higher than the Australian, this country uses almost 400 times the amount of heroin consumed in America. The use of cocaine is twice as great in Australia as in America or Great Britain. These figures suggest that the taking of potent drugs is greater here than is generally imagined. Legislation to amend the regulations relating to dangerous drugs and poisons, with a view to more effective control over the consumption of these materials, is at present under consideration in several of the Australian states.

Consumption of Dangerous Drugs

	1931	1934
Morphine		
Great Britain	17.72	3.90
United States	16.89	17.19
Australia	12.97	13.36
New Zealand	9.96	9.70
Heroin		
Great Britain	1.09	0.98
United States	0.06	0.01
Australia	3.10	3.90
New Zealand	1.99	0.65
Cocaine		
Great Britain	5.48	5.00
United States	6.19	6.87
Australia	12.93	12.76
New Zealand	5.31	4.52

Dr. W. B. Castle Lectures in Australia

Primarily at the invitation of the permanent postgraduate committee of the Victorian branch of the British Medical Association, Dr. W. B. Castle, director of Thorndyke Memorial Laboratories and of the City Hospital, Boston, delivered six postgraduate lectures. Subsequently, by arrangement with the state postgraduate committees, he gave further lectures and demonstrations in Sydney and Brisbane. Dr. Castle took as his subjects the pathologic physiology and classification of the anemias, the etiology of nutritional deficiency anemias, the diagnosis and treatment of anemias, the hemorrhagic diseases, the general consideration of vitamin deficiencies and the clinical manifestations of vitamin deficiencies. He referred to anemia as a physiologic rather than a morphologic problem. The importance of anoxemia as a marrow stimulant was stressed. The function of the spleen is a mystery. Stippling of the red cells is a form of reticulocytosis. The greatly increased need

for iron in women was emphasized. Chlorosis has not disappeared. Administration of iron is essential in the treatment of hookworm disease. Condemnation of many of the commercial iron and liver preparations on the market was expressed, and the new "efficiency unit" of liver preparations was announced. In the lectures on the hemorrhagic diseases, the effect of the recently discovered vitamin K was described. Although splenectomy in the treatment of thrombopenia increases the platelets in the circulating blood, it is not otherwise a specific measure. The platelets are antigenically related to the vascular endothelium. Hodgkin's disease is a megakaryocyte tumor. The fundamental defect in hemophilia is the slow conversion of prothrombin into thrombin. In this disease also the platelets are not backed up by proper fibrin formation.

The visit of Dr. Castle was valuable not only for the refreshingly modern understanding of blood pathology that he conveyed but also for the impetus he gave to graduate education and study. He also played an important part in cementing the medical associations of America and Australia. In his concluding remarks he extended an invitation to Australian medical graduates to visit the United States and offered to facilitate their wishes regarding the institutions or centers they might wish to visit. He styled himself a future unofficial Australian ambassador in America. It is hoped that Dr. Castle's tour is but a prelude to further visits of American medical scientists of similar high caliber.

POLAND

(From Our Special Correspondent)

Sept. 24, 1938.

The Prevention of Lead Poisoning in Foundries

In the State Institute of Hygiene at Katowice, Polish Silesia, Dr. Jan Adamski has performed systematic examinations of blood smears from 3,000 workers in lead and zinc foundries. He studied the percentage of basophilic red cells, estimating the number at 200 per million cells as evidence of lead poisoning. The results have shown that the percentage of poisoned workers is approximately the same in the zinc foundries as in the lead foundries, although zinc ore contains much less lead than lead ore. The relatively high incidence of lead poisoning in the zinc industry is probably due to the inadequacy of health protection in zinc foundries in comparison with that in the lead industry. The author found that mass blood examinations for basophilic spotting of red cells is the method of choice for discovering lead poisoning, especially in the earliest stages of the disease. He requires blood examinations to be repeated regularly every three months on all factory workers who are exposed to lead.

Typhoid in Warsaw

As a large increase in typhoid has been observed in Warsaw every autumn, the boards of health have taken prophylactic measures. The number of wards for typhoid in the hospitals has been enlarged; the hygienic state of food supplies, especially in fruit shops and dairies, has been controlled by the health authorities, and the population has been instructed by popular lectures and posters about means of prevention.

"Epidemic Physicians"

The Ministry of Labor and Social Welfare has created lists of "epidemic physicians." These physicians are sent to places where an increase in epidemic diseases has been observed, in order to organize prophylaxis and therapy.

Exhibition of Hospital Organization

The first exhibition of the Polish hospital organization was opened in Warsaw in September. The part played by the hospitals in public health and their activity in controlling infectious diseases were demonstrated. The section of architecture for hospitals presented the general ideas in the building of hospitals and in their interior fittings. The interiors of all the hospitals in Poland were illustrated. The exhibition was much frequented by the public, who listened to talks on hygiene with great interest.

The Reduction in Prices of Drugs

To make reasonable the prices of medicines for the poor, the authorities ordered the pharmacists to cut the prices of all drugs by 10 per cent. In addition there was prepared a list of about 100 drugs which have to be supplied to the unemployed at cost price.

Marriages

GRADY CORNELL SISKE, Pleasant Garden, N. C., to Miss Robbie Emily Dunn of Greensboro in High Point, August 22.

MELVIN SCHUDAK, Hot Springs National Park, Ark., to Miss Elaine Kessler of White Castle, La., in August.

ROBERT GORDON JOHNSTON, New Haven, Conn., to Miss Eleanor Talcott Fisher of Orinda, Calif., August 12.

HUGH CABOT, Rochester, Minn., to Mrs. Elizabeth Cole Amory of Boston, in Hingham, Mass., October 8.

JOHN McIVER JACKSON, Front Royal, Va., to Miss Rachel Jackson Blythe at Huntersville, N. C., in June.

WALTER HENRY JAESCHKE to Miss Inga Walhus, both of Madison, Wis., in Rockford, Ill., in September.

JAMES ROBERT SHANKLIN, Bluefield, W. Va., to Miss Helen Throck Morton of Arlington, Va., August 10.

RALPH FOSDICK SPENCER, Hudson, N. Y., to Miss Mary Elizabeth Puleston of Sanford, Fla., August 5.

JAMES FLOURNOY MARSHALL to Miss Mildred Gordon Coleman, both of Winston-Salem, N. C., June 4.

FRANKLIN I. HARRIS to Miss Alleene Dunker, both of San Francisco, at Carson City, Nev., August 16.

DAVID OSCAR SMITH, Washington, D. C., to Miss Grace Henderson of Monroe, N. C., September 3.

EDWARD JOHN PURCHLA, Chicago, to DR. ROSE HEDWIG KWAPICH of Toledo, Ohio, September 27.

HERMAN L. MELTZER, Clinton, Ill., to Miss Elsie Thornton of Farmer City in St. Louis, August 18.

CHARLES W. MATTHEWS to Miss Thelma Juanita Carey, both of New Vienna, Ohio, in August.

TOM HALL MITCHELL to Miss Mazie F. Moore, both of Mobile, Ala., in Tulsa, Okla., July 29.

WALTER SIMMONS JR., Charleston, S. C., to Miss Ruth Wackerman of Norfolk, Va., in June.

THEODORE WINSLOW JONES to Miss Elizabeth Gamwell, both of Pittsfield, Mass., September 30.

RAYMOND JOHNSON SHERER, Jasper, Ala., to Miss Barbara Farrar Palmer of Dora recently.

DONALD C. SHARPE, Verona, Wis., to Miss Lorraine Nauman of Dubuque, Iowa, June 25.

JOHN HOBART JUDSON, Arlington, Va., to Miss Joyce Mary Duffield of Miami, Fla., in July.

VERNE CLIFTON LANIER, Welcome, N. C., to Miss Lela Hedrick of Lexington, June 30.

WILLIAM EDWARD BRETZ to Miss Ruth Emily Converse, both of Hinsdale, Ill., September 10.

CLARE C. JONES to Miss Doris Kintz, both of Spencer, Iowa, in Sioux Falls, S. D., July 25.

SIDNEY A. SLATER, Worthington, Minn., to Mrs. Charles Moulton Smallwood, June 17.

OWEN DANIEL MOORE, Knoxville, Tenn., to Miss Emily Roberts of Etowah, July 26.

HAROLD LAWTON ROGERS, Albertville, Ala., to Miss Frances Love McKenzie in July.

CECIL E. JOHNSON, Rensselaer, Ind., to Miss Gladys Culp of Francesville, July 28.

EDGAR W. MEISER to DR. MARY ELLEN SMITH, both of Lancaster, Pa., July 23.

JOHN J. SAZAMA JR., Brookfield, Ill., to Miss Sonia Gorecki of Chicago, August 20.

PAUL R. MIRAGLIA, Conshohocken, Pa., to Miss Eleanor De Marino, June 4.

Deaths

Andrew Johnson Crowell, Charlotte, N. C.; University of Maryland School of Medicine, Baltimore, 1893; member of the House of Delegates of the American Medical Association, 1909, 1915, 1922, 1925, 1926, 1929, 1930 and 1931; member of the Medical Society of the State of North Carolina; past president of the Mecklenburg County Medical Society and the Tri-State (Carolinas and Virginia) Medical Society; member of the American Association of Genito-Urinary Surgeons and the American Urological Association; fellow of the American College of Surgeons; past president of the North Carolina Urological Association; past president of the state board of health; on the staffs of the New Charlotte Sanatorium and the Presbyterian Hospital; at one time secretary and treasurer of the North Carolina Medical College and professor of genito-urinary surgery; aged 71; died, September 21, in a local hospital of carcinoma of the stomach.

Franz John A. Torek ● New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the American Surgical Association; fellow of the American College of Surgeons; past president of the American Association for Thoracic Surgery; adjunct professor of surgery at the New York Post-Graduate Medical School and Hospital 1899-1915; consulting surgeon and formerly attending surgeon to the Lenox Hill Hospital; for many years attending surgeon to the New York Skin and Cancer Hospital; originator of the Torek operation for undescended testicle; contributor of a chapter on thoracic surgery in Johnson's "Operative Therapeusis" and on esophagectomy in "Cyclopedia of Medicine"; aged 76; died, September 19, in Vienna of bronchopneumonia.

Winfield Scott Farmer ● Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1890; member of the American Psychiatric Association; instructor in clinical psychiatry at his alma mater; medical superintendent of the Central State Hospital; aged 71; died, August 5, in the Vanderbilt Hospital of bronchopneumonia and carcinoma.

John Francis McCusker, Providence, R. I.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; fellow of the American College of Surgeons; formerly connected with the U. S. Public Health Service; aged 72; died, August 27, in the Rhode Island Hospital of cerebral hemorrhage.

Edward Taylor Hull, New York; Columbia University College of Physicians and Surgeons, New York, 1904; fellow of the American College of Surgeons; on the staff of the Lincoln Hospital; aged 58; died, August 29, in the Lenox Hill Hospital of hemorrhage into the thalamus due to hypertensive cardiovascular disease.

Carroll D. Evans, Columbus, Neb.; College of Physicians and Surgeons, Baltimore, 1882; member of the Nebraska State Medical Association; fellow of the American College of Surgeons; on the staffs of the Columbus and St. Mary's hospitals; aged 82; died, August 12, of gangrene, sepsis and arteriosclerosis.

Joseph Aspray, Spokane, Wash.; Tufts College Medical School, Boston, 1902; member of the American Roentgen Ray Society and the Radiological Society of North America; served during the World War; aged 59; died, August 20, in the Sacred Heart Hospital of uremia, arteriosclerosis and hypertension.

Robert Wayne Noaker ● Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1917; served during the World War; aged 44; on the staffs of the Grant Hospital, St. Francis Hospital, Children's Hospital and the White Cross Hospital, where he died, August 26, of rheumatic heart disease.

Isaac Eldridge Huff, Roanoke, Va.; College of Physicians and Surgeons, Baltimore, 1892; member of the Medical Society of Virginia; past president of the Roanoke Academy of Medicine; on the staff of the Shenandoah Hospital; aged 72; died, August 17, of coronary thrombosis and pneumonia.

Czar Clinton Johnson ● Lincoln, Neb.; John A. Creighton Medical College, Omaha, 1907; lecturer on industrial hygiene at his alma mater; fellow of the American College of Surgeons; served during the World War; on the staff of St. Elizabeth's Hospital; aged 57; died, August 21, of coronary thrombosis.

John Thomas McDonald, Brawley, Calif.; University of Louisville (Ky.) Medical Department, 1900; served during the World War; at one time connected with the U. S. Veterans Bureau and Veterans Administration; aged 64; died, July 31, in Los Angeles of arteriosclerosis.

Clyde Achillis Eckler, Dry Ridge, Ky.; Miami Medical College, Cincinnati, 1902; member of the Kentucky State Medical Association; past president and secretary of the Grant County Medical Society; aged 61; died, August 10, of hypertensive cardiovascular disease.

William Wallace Cornog, Lavonia, Ga.; Atlanta Medical College, 1888; formerly mayor and chairman of the school board; served during the World War; aged 73; died, August 25, in the Veterans Administration Facility, Atlanta, of myocarditis and arteriosclerosis.

George Nelson Heilig, McClure, Ill.; Barnes Medical College, St. Louis, 1902; member of the Illinois State Medical Society; member of the board of education; aged 61; died, August 16, in the Southeast Missouri Hospital, Cape Girardeau, Mo., of angina pectoris.

James Morgan Ballew, Memphis, Texas; Louisville (Ky.) Medical College, 1891; member of the State Medical Association of Texas; served during the World War; aged 75; died, August 12, in a sanatorium at Excelsior Springs, Mo., of congestive heart disease.

Frank H. Hancock, Norfolk, Va.; University College of Medicine, Richmond, 1896; member of the Medical Society of Virginia; served during the World War; formerly county health commissioner; city physician; aged 65; died, August 15, of cirrhosis of the liver.

George Preston Wintermute, Berkeley, Calif.; Jefferson Medical College of Philadelphia, 1893; formerly clinical instructor in surgery (otology, rhinology and laryngology) Stanford University School of Medicine; aged 67; died, July 15, of coronary occlusion.

Martin Lewis Tirrell, New York; University of the City of New York Medical Department, 1893; member of the Medical Society of the State of New York; aged 74; died, July 31, in St. Luke's Hospital of pyelonephritis, chronic cystitis and bronchopneumonia.

Victor Leo Arthur Langenderfer ● Toledo, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909; aged 51; formerly on the staff of St. Vincent's Hospital, where he died, August 7, following an operation for appendicitis.

Monsell Ray Bell, Keyser, W. Va.; University of Maryland School of Medicine, Baltimore, 1903; member of the West Virginia State Medical Association; aged 59; died, August 31, in the Allegany Hospital, Cumberland, Md., of myocarditis.

Walter E. Mitchell ● Bushnell, Fla.; Southern College of Medicine and Surgery, Atlanta, Ga., 1914; secretary of the Sumter County Medical Society; aged 54; died, August 24, in a hospital at Atlanta of cerebral hemorrhage, arteriosclerosis and nephritis.

Francis B. Fite, Muskogee, Okla.; Southern Medical College, Atlanta, 1886; fellow of the American College of Surgeons; at one time mayor; on the staff of the Muskogee General Hospital; aged 76; died, August 13, of cerebral hemorrhage.

Joseph R. Brown, Lavonia, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1899; member of the Medical Association of Georgia; aged 68; died, August 19, in a hospital at Atlanta, of pulmonary hemorrhage and bronchiectasis.

W. Clinton Linville ● Goldsboro, N. C.; University of Maryland School of Medicine, Baltimore, 1903; at one time member of the state eugenics board; medical superintendent of the State Hospital; aged 59; died, August 30, of tuberculosis.

Eugene Monroe Allee, Speed, Mo.; Beaumont Hospital Medical College, St. Louis, 1892; member of the Missouri State Medical Association; also a druggist; formerly county coroner; aged 71; died, August 28, of cerebral hemorrhage.

Hugh L. Berry, Memphis, Tenn.; Vanderbilt University School of Medicine, Nashville, 1900; member of the Tennessee State Medical Association; aged 65; on the staff of St. Joseph's Hospital, where he died, August 23, of hypertensive heart disease.

Leonard Allen Baker ● Middleboro, Mass.; Harvard University Medical School, Boston, 1905; formerly a member of the board of health; on the staff of St. Luke's Hospital; aged 57; died, August 8, in Boston of coronary heart disease.

Lewis Jones Blake ● Spartanburg, S. C.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; for many years president of the city board of health; aged 74; died, August 28, of myocarditis, cystitis and pyonephrosis.

Peter Hoffman Jr. ● Jersey City, N. J.; University of the City of New York Medical Department, 1882; for many years police physician; formerly on the staff of St. Francis Hospital; aged 77; died, August 1, of gastric carcinoma.

Granville B. O'Roark, Grayson, Ky.; Kentucky School of Medicine, Louisville, 1890; member of the Kentucky State Medical Association; on the staff of the J. Q. Stovall Memorial Hospital; aged 77; died, August 17, of heart disease.

Milton Morris Abeles, New York; University and Bellevue Hospital Medical College, New York, 1930; member of the psychiatric division of the Bellevue Hospital; aged 32; was killed, August 13, in an airplane accident in Germany.

Charles Edwin Blomgren ● Chicago; Rush Medical College, Chicago, 1899; on the staff of Augustana Hospital; aged 67; died, July 6, at his summer home in Lake Geneva, Wis., of coronary thrombosis and arteriosclerosis.

William Craw Gill, Cleveland; Western Reserve University Medical Department, Cleveland, 1900; veteran of the Spanish-American and World wars; aged 63; died, August 3, in St. Alexis Hospital of arthritis and arteriosclerosis.

Charles Wells Cropper, Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1876; member of the Medical Society of the State of New Jersey; aged 90; died, August 8, of myocarditis and arteriosclerosis.

John Hampton Patton, Northport, Ala.; Maryland Medical College, Baltimore, 1902; member of the Medical Association of the State of Alabama; aged 59; died, in August, of injuries received in an automobile accident.

Norman Almon Burgess, Rock Creek, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of Ohio Wesleyan University, 1904; aged 59; died, August 8, of hemiplegia, arteriosclerosis and nephritis.

Otis Little Cameron, Indian Hill, Ohio; Medical College of Ohio, Cincinnati, 1886; formerly county coroner and member of the board of health in Cincinnati; aged 76; died, August 21, of arteriosclerosis and angina pectoris.

Everett Allen Anderson, Georgetown, Ky.; Medical College of Ohio, Cincinnati, 1889; for many years connected with the United States Army; aged 71; died, August 31, of carcinoma of the lungs, liver and prostate.

Thomas E. Longshaw, Philadelphia; Jefferson Medical College of Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; aged 63; died, August 31, in Atlantic City, N. J., of acute myocarditis.

James Foster Merrit, Hot Springs National Park, Ark.; Dallas (Texas) Medical College, 1901; member of the Arkansas Medical Society; health officer; aged 69; died, August 11, of undulant fever and heat exhaustion.

Albert James Nute, Boston; Harvard University Medical School, Boston, 1902; at one time connected with the U. S. Public Health Service; served during the World War; aged 62; died, July 25, of heart disease.

Mary Elizabeth Jones, Boston; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1890; aged 83; died, July 14, in the City Hospital of a hip fracture received in a fall.

Walter C. Palmer, Ranger, Texas; Columbian Medical College, Kansas City, Mo., 1899; formerly a pharmacist; served during the Spanish-American and World Wars; formerly health officer; aged 60; died, July 7.

William S. Lockert, Ashland City, Tenn. (licensed in Tennessee in 1890); county health officer; formerly member of the state legislature; aged 85; died, August 15, of uremia, arteriosclerosis and nephritis.

Ira Willis Ballard, Forest Park, Ga.; University of Alabama School of Medicine, University, 1919; member of the Medical Association of Georgia; aged 54; died, August 5, of streptococcic pneumonia.

Jonathan Shelton Hollis, Covin, Ala.; Medical College of Alabama, Mobile, 1884; member of the Medical Association of the State of Alabama; formerly member of the state legislature; aged 82; died, July 28.

Alfred Augustus Wheeler ● Leominster, Mass.; Harvard University Medical School, Boston, 1894; on the staff of the Leominster Hospital; aged 68; died, July 22, of carcinoma of the prostate.

Winston Churchill Crabtree ● San Diego, Calif.; University of Michigan Medical School, Ann Arbor, 1928; aged 36; died, July 14, in the Mercy Hospital of subacute bacterial endocarditis.

Frederick A. McWilliams, Monticello, N. Y.; Bellevue Hospital Medical College, New York, 1876; aged 86; died, July 20, in the Hamilton Avenue Hospital of chronic myocarditis.

Royal Wells Amidon, Chaumont, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1877; aged 84; died, July 8, of coronary thrombosis.

John Cotton Henry ● Athens, Ohio; Jefferson Medical College of Philadelphia, 1929; past president of the Athens County Medical Society; aged 34; died, August 9, of pneumonia.

Charles Dougald Black, Lansing, Mich.; Kansas City Homeopathic Medical College, 1891; at one time city physician and health officer; aged 85; died, August 19, of heart disease.

Warren Elsworth Danley ● Union City, Mich.; Northwestern Medical College, St. Joseph, Mo., 1889; formerly health officer; aged 73; died, August 10, of cerebral hemorrhage.

Edwin Louis Brown, Latta, S. C.; Medical College of South Carolina, Charleston, 1886; aged 79; died, August 11, in a hospital at Charlotte, N. C., of coronary occlusion.

Wilber J. James ● Excelsior Springs, Mo.; Eclectic Medical Institute, Cincinnati, 1894; aged 70; died, August 13, in the Excelsior Springs Sanitarium of bronchopneumonia.

Edwin Porter Linfield, Brockton, Mass.; Dartmouth Medical School, Hanover, N. H., 1879; member of the Massachusetts Medical Society; aged 82; died, July 24.

Oliver Joseph Miller, Sanford, Fla.; Jefferson Medical College of Philadelphia, 1905; aged 55; was found dead, August 3, of carbon monoxide poisoning self administered.

Gaylord McElroy Andrews, Auburn, Neb.; Marion-Sims College of Medicine, St. Louis, 1898; aged 67; died, July 1, in Minden of carcinoma of the mediastinum.

John Perry Martin ● Oakland, Calif.; California Medical College, San Francisco, 1903; aged 67; died, July 4, of chronic nephritis, heart disease and hypertension.

William Edwin Morgan, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1900; aged 59; died, July 26, of carcinoma of the pharynx.

Richard Henry Howard, Chicago; Meharry Medical College, Nashville, Tenn., 1916; aged 49; died, August 22, in the Provident Hospital of heart disease.

John Sorensen, Pasadena, Calif.; Københavns Universitet Laegevidenskabelige Fakultet, Denmark, 1892; aged 71; died, July 20, of pulmonary tuberculosis.

Charles Bell White, Walton, N. Y.; Bellevue Hospital Medical College, New York, 1883; aged 81; died, July 5, of a self-inflicted gunshot wound.

Edward Harvey Ellis, Marlboro, Mass.; Boston University School of Medicine, 1879; bank president; aged 81; died, August 2, of pneumonia.

Emily M. Luff, Oak Park, Ill.; Hahnemann Medical College and Hospital, Chicago, 1894; aged 75; died, August 8, of cerebral hemorrhage.

Moses Jacobson, Los Angeles; Cooper Medical College, San Francisco, 1901; aged 60; died, July 20, in the French Hospital.

Clarence L. Marlatt, Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1897; aged 63; died, July 31.

Benjamin Franklin Schofield, Fall River, Mass.; College of Physicians and Surgeons, Boston, 1896; aged 75; died, July 13.

William A. Webb, Lithonia, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1910; aged 63; died, July 2.

Reuben Nyswander, Grand Rapids, Ohio; Illinois Medical College, Chicago, 1904; aged 60; died, August 9, of heart disease.

Lafayette A. Craft, Herrick Center, Pa.; Eclectic Medical College of the City of New York, 1883; aged 80; died, July 19.

Ellen Bernadette Lysaght ● Brooklyn; Cornell University Medical College, New York, 1901; aged 63; died, July 30.

George Wesley Mixon, Hackleburg, Ala.; Medical College of Alabama, Mobile, 1904; aged 51; died, August 23.

Elbert Marion Myers, Bullagap, Tenn. (licensed in Tennessee in 1895); aged 67; died, August 4, of heart disease.

William Bradshaw Sharp, Hertford, N. C.; Leonard Medical School, Raleigh, 1901; aged 61; died, July 25.

Reese Edwin Reese, Fresno, Calif.; Cooper Medical College, San Francisco, 1895; aged 73; died, July 30.

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Bureau of Investigation

IONITE

A Fraudulent "Consumption Cure"

Ionite was the trade-name of a "patent medicine" sold from Salt Lake City as a cure for tuberculosis. Five men were involved in the matter: (1) Jesse F. Barnhill, (2) James W. Morris, (3) Dean V. Johnson, (4) Asa L. Eddy and (5) Marcus Eddy. All five men were indicted on the charge of having used the United States mails in furtherance of a scheme to defraud. The two Eddys pleaded guilty; the other three went to trial. Morris and Johnson were acquitted; Barnhill was convicted and appealed. On April 12, 1938, the Circuit Court of Appeals, Tenth Circuit (Judges Phillips, Bratton and Williams), affirmed his conviction.

Barnhill seems to have been the king-pin of the cruel fraud. According to the testimony in the case he and Morris owned property in Nevada on which there was some clay. This clay was shipped to Salt Lake City and turned over to the Eddys, who had a drug store. Asa L. Eddy, the father of Marcus, was, according to information in the files of the Bureau of Investigation of the American Medical Association, a pharmacist who had previously owned a drug store. Marcus Eddy was not a registered pharmacist but, according to information received, had been a railway brakeman.

The Eddys took the clay shipped to them by Barnhill and proceeded to make a "consumption cure" out of it, by adding some "salts" to it, together with a small amount of potassium iodide, some glycerin, flavoring it with vanilla and sweetening it with saccharin. The finished product, according to Asa Eddy's testimony had the following composition:

Clay	20 pounds
Glauber's (horse) salts	8 pounds
Epsom salt	8 pounds
Potassium iodide	3 ounces
Glycerin	1 gallon
Water	5 gallons

This, according to Eddy's testimony made 108 bottles of "Ionite," each of which sold for Two Dollars ($2.00)! At the time the post-office officials investigated the case 3,348 bottles had been sold.

Dean V. Johnson, although to the uninitiated apparently one of the chief factors in this swindle, seems to have been a stool-pigeon used by Barnhill as a "front." What, if anything, he got out of the fraud does not appear in the appellate court's review of the case. Long letters signed by Johnson were sent out on stationery bearing Johnson's name and address (Pleasant Grove, Utah) stating that he, Johnson, had been a sufferer from tuberculosis for some years and that the best efforts of physicians had completely failed to cure him. But after taking Ionite he claimed he was restored to normalcy! Accompanying the letter was an affidavit, also signed by Johnson, to the same general effect. It was brought out at the trial that Johnson was still tuberculous, and that whatever improvement he had shown was due to a pneumothorax performed by a reputable physician in a hospital. It was also proved that the letters and affidavits sent out in Johnson's name were dictated by Barnhill and sent out from Barnhill's office.

Nor was this all that stool-pigeon Johnson was used for. Large advertisements were published in the *Denver Post* in April, May and June 1935 all signed by Johnson and headed in large, black type: "ALL TUBERCULARS—NOTICE." These advertisements, in general, repeated the same fairy story about Johnson and his alleged experience with Ionite that appeared in the Johnson letters and affidavits. One of the advertisements was a vituperative attack on the medical profession in general and the American Medical Association in particular. The facts were that the advertisements were prepared and paid for by Barnhill, who admitted to post-office officials that he "paid for everything."

Two additional advertisements that appeared in the *Denver Post* in 1936 and 1937, respectively, were not signed by Johnson but appeared under the name of "Ionite Products." These are of interest in view of the fact that by May 1936 Johnson evidently had lost faith in Ionite. For in that month he wrote a letter in which he admitted that he did not know of a cure for tuberculosis and advised his correspondent to go to the best physician he could afford. A month later—in June 1936—Johnson wrote another letter in which he admitted that he had tuberculosis!

Johnson was not the only stool-pigeon used by Barnhill in his fraudulent exploitation. Another affidavit was sent broadcast from Barnhill's office, signed "Mrs. Helene Greene." According to Mrs. Greene's affidavit she had a son, Delane, who for two years had suffered from tuberculosis and all efforts on his behalf by physicians had failed. But, Ionite had restored little Delane to perfect health. This affidavit was also dictated by Barnhill and when Barnhill's attorneys put Mrs. Greene on the stand she practically repudiated it although admitting that she signed it! She admitted that "the doctor did not say anything about her son having tuberculosis," nor had any x-ray examination ever been made, nor did she ever have her boy examined by "three specialists"—all of which the affidavit, signed by her but dictated by Barnhill, had affirmed.

During the trial a woman testified that having read the advertisements in the *Denver Post* she had ordered Ionite to give her tuberculous husband. The poor fellow took two bottles, got much worse and, some months later, died. Another witness, a man, testified that his tuberculous wife after reading the Johnson (Barnhill) advertisement in the *Denver Post* began taking Ionite and bought between 18 and 21 bottles. When she started taking Ionite she was walking around and doing her housework but soon began to lose weight until she had to go to a hospital. When the husband wrote asking for a refund he received no reply.

The Barnhill swindle, like many another consumption cure, worked the "refund" racket. The advertisements stated that if the purchasers were dissatisfied with the results the concern would refund the price of the first two bottles. In fact, this point was largely the basis of Barnhill's appeal, his attorneys arguing that the trial court erred in failing to instruct the jury as to the effect of a promise to refund the price, if made and carried out in good faith. This, too, in spite of the fact that Barnhill's attorneys at the trial made no request for such instruction. The Court of Appeals met the point admirably. Judge Williams, who wrote the decision, emphasized the fact that the "refund" was a most limited one; it applied only to the price of the *first two bottles*. Said the judge:

> "It is highly probable that a man seriously affected with tuberculosis, and groping for a straw to save his mortal existence, for psychological reasons might reasonably at first be deceived into believing he was receiving benefits. Furthermore, it is likely that a person in such a condition of health would purchase more than two bottles and the refund offer might be considered a part of the scheme to induce such a person to get started in order to sell him many bottles of Ionite and make a nice profit even in face of a refund for two bottles."

The individuals found guilty of this cruel piece of medical fraud were actually small fry fakers. But what shall be said of a great metropolitan newspaper that accepted advertisements of such a fraud as Ionite and remained not only immune to any legal reprisals but seemed equally oblivious to any moral implications?

Medical Mythology.—Isis was the great goddess of medicine. It was she who gathered up the slain body of Osiris. Her sisters Nephthys and Neith were queens of the night and protected mortals from the pains that trouble them after dark. Sekhmet, the wife of the medical god Ptah, had the head of a lioness. She was the bone-setter and therapeutist, and saved from fire as well as from sickness. Bes, the smiling little god with a Mongolian face, presided over the birth house at the temples where the women were confined, and Hathor fed the infant and cured sterile mothers. Ubastet, Sekhmet's sister, was an obstetric goddess, and Meskhenet had charge of the hot stones over which women crouched in labor.—Hurd-Mead, Kate Campbell: A History of Women in Medicine, Haddam, Conn., the Haddam Press, 1938.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

THERAPEUTIC MALARIA AND TRANSMISSION

To the Editor:—Frequently I use malaria inoculation for patients with dementia paralytica. 1. How soon after the inoculation can the mosquito carry their malarial infection to others? 2. How soon should they be put under screens? 3. What is the danger if they are allowed parole or visits? What difference is there in the activity of the mosquitoes between day and night?

M.D., California.

ANSWER.—1. Experience with inoculation malaria has shown that, following intravenous inoculation, Plasmodium vivax may be demonstrated in the blood of the recipient three days after the injection. In the majority of patients the plasmodium is present by the fourth or fifth day, usually from eighteen to thirty-six hours before the first chill.

2. The patient should be placed in a screened room immediately after inoculation, if all precautions to prevent dissemination of malaria are employed.

3. The danger of parole or visits during the incubation period lies in the (1) dissemination of malaria, (2) acquiring of intercurrent respiratory infections which may lead to pneumonia, (3) injudicious taking of drugs such as any of the coal tar products which may abort the malaria, and (4) development of inoculation chill and fever, which may appear from six to fifteen hours after the inoculation in patients who are mentally dull and which may lead to various complications as well as to misinterpretation of the chill.

The infected anopheles mosquito can transmit the plasmodium either during the day or during the night, but as this type of mosquito is a night feeder, it is more active during the night and the likelihood of transmission is greater, therefore, after sundown.

SCHNEIDER'S INDEX

To the Editor:—I should like a discussion of Schneider's index.

M.D., Illinois.

ANSWER.—In 1920 Edward C. Schneider of the Medical Research Laboratory, Air Service, Mitchel Field, Long Island, New York, published a paper entitled "A Cardiovascular Rating as a Measure of Physical Fatigue and Efficiency" (THE JOURNAL May 29, 1920, p. 1507), which proved to be of some value in weeding out the distinctly physically unfit among the individuals tested. He presented the plan in the first sentence of his paper: "The need of a measure for physical efficiency whereby degrees of fatigue, physical fitness and health may be determined has been felt alike by the medical profession and instructors in physical education and school hygiene." In the fifth paragraph he made the significant comment: "The cardiovascular changes during altered physical fitness have been studied most, and it is these that are considered in this paper. The tests here discussed should not be confused with functional heart tests. We are concerned with the cardiovascular changes only so far as they give evidence of fatigue and health changes in the body."

Toward the end of the paper he presented in detail the scheme of study which consisted of the determination of the heart rate reclining and standing, the number of beats the heart rate increases when the standing and reclining postures are compared, the acceleration in the pulse rate after exercise, the time taken by the pulse to return to normal and, lastly, the rise or fall in the systolic blood pressure on standing. A scoring system was used, based on these determinations. A perfect score was 18. For the details of the scoring the reader is referred to the original article by Schneider.

Schneider concluded: "That there may be value in assembling the circulation data under such a point system is indicated from an analysis of fifty-four cases of aviators who, when examined by the medical officers of the departments of the laboratory, were found to be ailing and physically below standard. . . . Only six of the fifty-four cases had a score of 10 or better, while 88.8 per cent had scores ranging between 9 and —1. These figures seem to indicate that a score of 9 or less is characteristic of physically unfit men."

A few years later F. S. Lee and J. D. Vanbuskirk (An Examination of Certain Proposed Tests for Fatigue, *Am. J. Physiol.* **63**:185 [Jan.] 1923) tried out Schneider's test in the case of a professor and three undergraduate students to determine the effect of unusual physical exercise: a walk of about fourteen miles a day on several work days, interspersed with rest days. They were unable to find that Schneider's test was a reliable criterion of daily physical fatigue, although it might have "value in the detection of pronounced physical deterioration amounting often to a pathological condition, or of fatigue in masses."

Thus it would seem that Schneider's test of physical fitness, like many others, must be interpreted with considerable caution. When, however, a distinctly low rating is obtained it is almost certain that the individual being tested is in poor condition. Under such circumstances the poor physical condition may be obvious without the test; but still the test gives something of a quantitative measurement and so may be of some use.

ABSORPTION FROM URINARY BLADDER

To the Editor:—Has any work been done or anything published relative to the capacity of the human bladder to concentrate urine? From clinical observation and some crude experimentation I believe it is possible that water can be resorbed from the urine in maintaining the water balance of the tissues, which to my knowledge has never been ascribed to it. I have never seen anything in the literature pertaining to this subject and have always seen the bladder described as merely a reservoir and nothing else. If any work has been published relative to this or the idea proposed will you inform me?

M.D., Connecticut.

ANSWER.—The possibility of absorption from the urinary bladder has been considered by many observers and a great variety of experiments have been made to determine the degree of absorption. A review of this work is included, with a list of references, in a paper written by Mann and Magoun entitled "Absorption from the Urinary Bladder" (*Am. J. M. Sc.* **166**:96 [July] 1923). Using phenolsulfonphthalein as the test substance in a series of experiments, they came to the conclusion that when the dye was placed in the urinary bladder it appeared in the excreted urine in relatively small amounts. They concluded that, while absorption undoubtedly takes place from the urinary bladder, it occurs to such a limited extent that it has little or no practical significance.

These deductions are corroborated by the work of Vickers and Marshall in a paper entitled "Permeability of the Urinary Bladder to Urea and Sodium Chloride" (*Am. J. Physiol.* **70**:607 [Nov.] 1924). They concluded from their experiments that urea and sodium chloride are possibly absorbed from the bladder but only to a slight degree. Although they did not attempt to estimate to what extent water is reabsorbed, they were under the impression that it could concentrate the urine but little.

OPERATIONS FOR STERILITY IN WOMEN

To the Editor:—A woman aged 36 wants to become pregnant. She had both fallopian tubes resected three years ago. Before this she had two pregnancies terminated by induced abortions due to severe vomiting. I am writing to ask whether surgical treatment would be advisable in order to allow her to become pregnant again. What are the chances of success both in her becoming pregnant and in her going to full term? What is the nature of this operation and what are the associated duties involved once she has become pregnant?

M. D., New York.

ANSWER.—Since the patient does not possess either fallopian tube, the choice of operation which may lead to a pregnancy lies between implantation of one ovary inside the uterine cavity and implantation of half an ovary on one or both corners of the uterus. The insertion of an ovary inside the uterine cavity has few adherents because the chances of having a baby after it are remote and there are too many associated complications. On the other hand, the operation of implantation of a part of an ovary on the uterine cornua, known as the Estes operation, is followed by a small percentage of successes.

Von Graff (*Iowa State J. Med.* **26**:31 [Jan.] 1936) collected sixty-six cases in which a graft of ovarian tissue was placed on a uterine horn or on a tubal stump. He reported fourteen pregnancies (21.2 per cent) following these operations. However, since only five of these pregnancies went to term, only 7.6 per cent of the operations, or one in 13.2 operations, resulted in a full-term baby. Among the remaining nine gestations there were six abortions and one ectopic pregnancy. The outcome in two cases was unknown. In von Graff's collected series of forty-one cases in which an ovary was transplanted into the uterine cavity, only three pregnancies (7.5 per cent) resulted, of which one went to term (2.4 per cent) and the other two ended in abortion. Reiprich (*Ztschr. f. Geburts. u.*

Gynäk. **104**:1 [No. 1] 1932) collected 200 ovarian transplants of all types and reported only five pregnancies (2.5 per cent) following these operations. Estes (*Surg., Gynec. & Obst.* **38**: 394 [March] 1924) followed up twenty-seven of eighty-eight patients on whom he had performed his ovarian transplantation operation and found that pregnancy had occurred in four of them (15 per cent). In a later article, Estes (*Am. J. Surg.* **26**:563 [June] 1934) reported that, in a series of fifty patients whose case records were complete, only four became pregnant (8 per cent). Two of these women had abortions and two had full-term babies.

Sovak (quoted by Greenhill: *Am. J. Obst. & Gynec.* **33**:39 [Jan.] 1937) states that four pregnancies resulted after the six Estes operations he performed. Three of these women had induced abortions but the fourth patient had a spontaneous abortion.

Should an operation be performed to overcome this patient's sterility and should a pregnancy follow, the patient will have to be watched closely during pregnancy and particularly in labor. Serious complications have occurred after these operations just as they have taken place after plastic operations on the fallopian tubes to overcome sterility.

EARLY HAY FEVER—COSEASONAL TREATMENT

To the Editor:—From August 4 to 11 I had three patients who started having hay fever earlier than usual. Please give a list of the flowers that pollinate in New England at this time. Is there any possibility that the unusual wet weather has caused some ragweed to pollinate early? Please outline a tentative series of ragweed injections to be given now to a man 38 years of age who is already having a vaccine composed of various bacteria to which he is skin positive and which apparently causes a severe asthma in the winter. He is one of the patients who has reactions to ragweed but has already begun to have severe attacks of sneezing.

OLIVER S. HAYWARD, M.D., New London, N. H.

ANSWER.—The ragweed hay fever season started earlier in sections where there had been considerable rainfall. There was a fair amount of pollen in the air in some sections, August 5. In New England as in most of the northern and central parts of the United States the ragweed constitutes the main cause of hay fever at this time of year. It is possible, of course, that this particular patient was extremely sensitive and hence had symptoms early. In addition, sometimes handling flowers of composite families brings on symptoms early.

The best method of coseasonal ragweed therapy consists of giving intradermally weak extracts of ragweed pollen, beginning with about 5 units and increasing slowly every day or every other day. After the season is over, the injections should be given subcutaneously about once every two weeks with the usual increases of from 25 to 50 per cent. No increase should be given if there is any considerable reaction.

SUBLUXATION OF SACRO-ILIAC—DISABILITY

To the Editor:—A man aged 40 sustained a severe trauma which resulted in a right sacro-iliac subluxation. In spite of treatment the joint remained after nine months painful and extremely tender to deep palpation along the site of the joint, and the patient is unable to bear full weight on the right leg without limping and severe pain. Will this ever return to normal so that he can do heavy laboring work without recurrence of symptoms so severe as to force him to discontinue? Is he permanently and totally disabled for pursuing his occupation of hard labor? What is the prognosis for ultimate cure?

DAVID KRAMER, M.D., Silver City, N. M.

ANSWER.—To answer this query one should have additional information. Treatment which has been carried out for the patient is not mentioned. It would be of some help to know whether or not the pain has been localized to the sacro-iliac joint or has radiated along the course of the sciatic nerve. Most injuries of the type referred to heal, with complete restoration of function, if the back is adequately protected for a sufficiently long time. If subluxation can be definitely established either by clinical examination or by roentgenographic studies, manipulation should be carried out with the patient fully relaxed by a general anesthetic. This manipulation consists principally of forced flexion of the thigh, with the knee completely extended, and abduction and hyperextension of the thigh at the hip. In view of the fact that the patient has been disabled for nine months, a bilateral body and leg cast should be applied after the manipulation and worn for three weeks. The cast should then be bivalved and the patient given daily heat and massage to the low back region. In addition the physical therapist should teach the patient exercises for contracting and strengthening the abdominal and the gluteal muscles. Six weeks from the date this program of treatment is begun, the patient may be allowed up wearing a back brace. Activity should be stopped short of fatigue or recurrence of the pain. If this program is followed, functional recovery may be anticipated approximately three months from the date of beginning treatment. The back brace should be worn for a full year as a safeguard against recurrent attacks of the pain. A few of the patients with low back injuries of the type described may not respond to the treatment outlined. These patients are entitled to the benefit of an arthrodesing operation on the joint affected.

Orthopedic procedures such as those described should afford a favorable prognosis so that the patient may eventually do heavy laboring work. He should not be permanently and totally disabled from pursuing an occupation of hard labor. The prognosis for ultimate cure depends largely on the type of treatment and the thoroughness with which it is carried out.

SPEECH DEFECTS IN FAMILY

To the Editor:—In a family of three boys and five girls of healthy parentage, with no history of syphilis or nervous diseases, the boys have defective speech which consists of inability to enunciate certain words or parts of words containing certain combinations of letters. For example, they say "trotlight" for spotlight, "roo" for you, "hooshe" for house. The defect is generally known as tongue-tie. However, the frenum of the tongue is normal and there is no malformation or defect in any part of the vocal apparatus. The males of the family are all intelligent and successful business men, two of them being married and having children. One of these men, married to a healthy mate, has three children: one girl, who talks well; a boy aged 5 who is apparently above the average in intelligence but who shows the same defects that his father has in speaking, and a younger boy not old enough for abnormality of speech to be detected. Is this a hereditary defect? Why does it appear in the males and not in the females? Beginning in the formative stage of life, could this defect be overcome by intelligent home training by a patient and persevering mother? Are there any institutions devoting special attention to correction of speech defects located in this or near by states? Please refer to any available literature on this subject, especially that bearing on home training for correction of defective speech. The father does not want his son to go through life handicapped as he is. M. D., Georgia.

ANSWER.—The problem of the influence of heredity on speech defects is still uncertain. Some speech deficiencies certainly run in families, but one cannot eliminate the influence of mimicry by children when they hear a parent manifesting a speech defect. There is furthermore no relationship between intelligence and the speech defect, so that the fact that some of the males in the family are successful business men and also the fact that the men have a defect and not the girls is not at all unusual, for where there is a disorder which is of hereditary origin, such as color blindness and hemophilia, it is not uncommon to find sex linking, whereby the females of the family carry the trait but do not manifest it, whereas the males manifest it and do not necessarily pass it on to their children. However, one would not judge from the degree of this type of defect that it is likely to be truly hereditary in origin because mispronunciation of words in a characteristic fashion is too complex to follow the usual genetic pattern that one would expect. In cases of speech difficulty training seems to be the most promising approach, and certainly the earlier the training is undertaken the more promising the therapy becomes. Mere drill sometimes is useful, and if the physician is too far away from a large university where there is a special department of speech analysis and correction he may attempt to do this with the younger members of the family. However, the psychologic and physical problems in the dynamics of speech are so complicated that it would seem dubious whether the physician could justify himself in making a thorough study of the whole problem in particular reference to a case, and it would probably serve his patients better, or at least the younger members of the family, to get in touch with a highly specialized department of speech difficulty, like the departments at Northwestern University or the University of Michigan. Definite speech clinics do not seem to be prevalent, at least in the South, but assistance might be obtained from the director of the Family Welfare Society Mental Hygiene Clinic in Atlanta, or the Grady Hospital Neuropsychiatric Clinic in that city. As far as literature is concerned, it is vast and conglomerate, but the following might be referred to:

Twitmyer, Edwin B., and Nathanson, Yale S.: Correction of Speech Defects, Philadelphia, P. Blakiston's Son & Co., 1932.
Travis, Lee E.: Speech Pathology, New York, D. Appleton-Century Company, 1931.
Stinchfield, S. M.: Speech Disorders, New York, Harcourt, Brace & Co., 1933.
West, R. W.: Disorders of Speech and Voice, Madison, Wis., College Typing Company, 1935.
Diagnosis of Disorders of Speech, 1936.
Blanton, Margaret Gray, and Blanton, Smiley: Speech Training for Children: The Hygiene of Speech, New York, Century Company, 1919 (this older volume is not considered up to date).

PRECOCIOUS MENSTRUATION

To the Editor:—I have a patient who is unique so far as my thirty years' general practice is concerned. This girl, just a little over 2 years of age, has been menstruating lightly for several months, but for the last three months she has menstruated more freely at regular intervals. Otherwise she is a normal child. Please advise possible cause, treatment and prognosis.

P. M. Richardson, M.D., Cushing, Okla.

Answer.—Children may show signs of premature menstruation or precocious maturity when there is no discoverable cause. In those instances in which the menstrual flow takes place at more or less regular intervals, secondary manifestations of sexual and somatic precocity may occur, although such cases have not been frequently recorded. Some of these little girls continue to menstruate for a certain period and then the flow stops entirely. Others have been observed to continue until the usual menstrual period.

A form of menstruation sometimes occurs in newborn babies, though in these cases the bloody discharge is usually small in amount and lasts only a short time. It has been thought that it bears some relationship to endocrine products of the placenta, and its cause may be compared with the enlargement of the breasts in newborn infants. Cases have been reported in which precocious menstruation has occurred as a result of ovarian tumor, though in this connection it should be recalled that numerous patients have been observed with ovarian tumors without premature sexual development or precocious menstruation. R. T. Frank recovered female sex hormones in the urine during the menstrual period of a girl 3 years of age. He concludes that, if the hormone is present in the urine, it indicates an ovarian tumor.

Precocious puberty in girls may also be the result of hypersecretion of the anterior lobe of the pituitary gland. In little girls of this type, mental development is slow and they tend to show excessive growth and increased sexuality.

The treatment depends on the underlying cause. The child should be kept under observation until the diagnosis is established. Little or nothing is to be expected from endocrine treatment in these cases.

The parents should be warned that, on account of premature sex development, impregnation may occur. In a case reported by Haller, menstruation began at 2 and a pregnancy occurred at 8 years of age.

POSSIBLE DANGERS FROM BOILER CLEANER

To the Editor:—Might there be deleterious effects on the health of enrollees as a result of the use in CCC camps of a boiler cleaning compound known as Industrial Boiler Water Treatment, manufactured by the Industrial Products Company, St. Joseph, Mo.

Oscar D. Goodhart, M.D., Fort Worth, Texas.

Answer.—This inquiry does not furnish statements with reference to the conditions of water use from which injury might be anticipated; that is, through water drinking or bathing, or from the manipulation of chemicals used in water treatment. For this reason the reply made is general and is without reference to any one particular product. The number of substances that are used in boiler treatment is legion and include sodium silicate, caustic soda, soda ash, trisodium phosphate, disodium phosphate, potassium salts, acetic acid, sodium phosphate, lime soda, calcium hydroxide, sodium aluminate, phosphoric acid, hydrochloric acid, zeolites (which are complex silicates of aluminum and alkali metals), cyanides, ferrous sulfate, sodium bicarbonate, tannic acid, gum catechu, hemlock bark extract, cactus juice, starches and fats. Almost any of these substances brought directly in contact with the skin might produce a dermatitis, so that boiler room workers are those most likely to be affected. Whenever other persons are damaged, this usually results from the misapplication of chemicals, and particularly the use of treated waters without due regard for the necessity of boiler and pipe flushing. Since fairly large amounts of some of these chemicals may be used in scale removal from boilers and pipes, it becomes clearly possible that negligence in thoroughly removing all these chemicals might lead to widespread injury to persons consuming the water and particularly in a restricted water system such as in a small camp. One consideration in this situation is with respect to the solution of lead in lead pipes and lead compounds that have been applied to pipe joints. The presence of appreciable quantities of carbon dioxide in water may distinctly influence the solubility of lead that may be present. In times past, soda water fountains extensively used lead pipes through which carbonated water passed until it was discovered that a possible lead exposure was thus introduced. The chemical content of a water supply prior to its introduction into boilers stands in some relation to the action of cleaning agents and the possibility of ensuing injury.

In some instances boiler water supplies are continuously treated with chemicals, use being made of practices not unlike those employed in the softening of waters by municipalities for general household use. Particularly, this process, when properly applied, is unlikely to lead to damage. So many factors may influence the possibility of injury under the circumstances mentioned that in any one given instance it is not practical to make precise claims. In the present instance the water should be analyzed for lead, chromates, acidity or alkalinity from samples taken at times and places most likely to be associated with injury.

SIMULTANEOUS ADMINISTRATION OF DIGITALIS AND THEOCALCIN

To the Editor:—Based apparently on the reports of death following the intravenous administration of calcium in patients receiving digitalis, certain physicians in this vicinity are of the opinion that it is dangerous to give theocalcin and digitalis at the same time to cardiac patients. I am of the opinion that the calcium present in the theocalcin tablet is not active as such and that there is no danger of a cardiac standstill resulting from the use of the two drugs. Please discuss this problem.

M. D., Arkansas.

Answer.—It is improbable that digitalis and theocalcin given at the same time in therapeutic doses will produce any untoward results. This combination has been given thousands of times and no report of unfavorable action has been found in the literature. Theocalcin is calcium theobromine with calcium salicylate. It contains about 10 per cent of calcium. The average dose of theocalcin by mouth (it is impossible to give it any other way) is 2 Gm. (30 grains) daily in divided doses. This dose contains about 0.2 Gm. (3 grains) of calcium. The largest recommended dose of 5 Gm. (75 to 80 grains) daily contains about 0.5 Gm. (8 grains) of calcium. It is doubtful that such amounts given by the oral route in divided doses will produce any effect on the blood calcium level. In the cases of sudden death reported by Bower and Mengle, calcium was given intravenously. In the experimental work concerning digitalis and calcium, the calcium was likewise given intravenously. In the experimental work showing the effect of calcium on the heart muscle the calcium was introduced intravenously or by perfusion. In such instances there will be an appreciable elevation of the blood calcium, and the calcium enters the heart muscle almost immediately. In the case of theocalcin the calcium is absorbed slowly from the gastrointestinal tract, passing through other organs before reaching the heart, and indeed it seems likely that some of it is precipitated in the intestinal tract in the form of insoluble salts and is not absorbed at all. The theobromine is the active ingredient. Neither reason nor experience points to any contraindication to the simultaneous use of these drugs.

SINUSITIS AND BACTEREMIA

To the Editor:—I would greatly appreciate some information concerning the incidence of pneumococcic and other bacteremias following both complicated and uncomplicated nasal sinusitis. References to the literature would be appreciated.

Saul Solomon, M.D., New York.

Answer.—Not much work has been done concerning the incidence of bacteremias following sinusitis. Bacteremia in the presence of uncomplicated sinusitis occurs rarely if at all, even though the febrile reaction is severe. In the series reported by Goldman of complications following sinusitis positive blood cultures were obtained in 44 per cent of the cases in which this test was done, and it was felt that this percentage would have been even higher if more than one culture had been taken on each patient.

The possibility of a bacteremia depends not only on the presence of a complication but also on the variety. Thus it is most likely in cavernous sinus thrombosis; it occurs in a high percentage of cases of meningitis, orbital abscess and osteomyelitis of the skull and is less common in brain abscess and orbital cellulitis.

Of sixteen bacteremias Goldman found Streptococcus hemolyticus in eleven cases, pneumococcus type III in two cases, pneumococcus type I in one case, pneumococcus type XXI in one case and Staphylococcus aureus in one case.

As a rule the occurrence of a positive blood culture in acute sinusitis points to the coexistence of a complication or some associated systemic disorder. Of course, it is open to question

whether the bacteremia is dependent on the severe sinusitis which causes the complication or whether the blood stream invasion is from the secondary focus.

Larsell, Veazie and Fenton, working experimentally with cats and rabbits whose sinuses and draining lymph nodes they inoculated with hemolytic streptococci, recovered the organism from the heart's blood, spleen and liver, thus showing conclusively that there was a hematogenous phase to the infection, the route being the pretracheal lymphatic vessels to the great veins and then into the right side of the heart and into the pulmonary capillary bed. However, it appears even in this experimental work that the blood stream is pretty well cleared of organisms in about twenty-four hours, the lymph nodes draining the sinuses, the lungs, the spleen and the Kupffer cells of the liver acting as filters.

References:

Goldman, J. S., and Schwartzman, Gregory: *Ann. Otol., Rhin. & Laryng.* **44**:961 (Dec.) 1935.
Goldman, J. L.: *Laryngoscope* **46**:500 (July) 1936.
Larsell, Olof; Veazie, Lyle, and Fenton, R. A.: Streptococcic Infection of the Lungs from the Paranasal Sinuses, *Arch. Otolaryng.* **27**:143 (Feb.) 1938.

DEATH FOLLOWING BLOW OVER LARYNX

To the Editor:—Recently I was called on to make a postmortem examination of a white man aged 28 who had been in a brawl and who, according to reports, had received one blow on the side of the face and a second about one inch below the larynx. Following this he was reported to have dropped dead. My examination gave essentially negative results except for bruises on the face and lips and a small bruise over the trachea in the spot before mentioned. There was no hemorrhage in this area except a small spot under the skin. There were no fractures of the laryngeal cartilages or of the tracheal rings and there was no gross edema. There was no cord injury. Would it be possible for a blow in this area to cause death? If so, please explain the mechanism involved.

M.D., Indiana.

ANSWER.—Deaths have been reported following single sudden blows on the larynx or trachea. They have been explained as arising from pressure on the carotid sinus or from insult to the vagus nerve, causing reflex cardiac paralysis. In most cases, in young persons with no cerebral or cardiac disease, the victim has been profoundly alcoholic. However, these cases are so rare and the explanation so theoretical that the observations are looked on with suspicion. Continued pressure on the larynx or trachea may produce asphyxial death, leaving little or no local evidence.

TREATMENT OF HEMANGIOMA IN INFANTS

To the Editor:—Please give the proper technic of using carbon dioxide snow or dry ice in the removal of a hemangioma which is just starting to grow on the abdomen of a baby 6 months old.

HARRY C. BARBER, M.D., Normal, Ill.

To the Editor:—I have been informed that the treatment of small hemangiomas of the skin of children is best accomplished either by radium or by carbon dioxide snow. What is the technic of using carbon dioxide snow? Would not freezing by means of ethyl chloride, which seems so much simpler, be satisfactory? One patient has a growing hemangioma of the scalp partly overlying the anterior fontanel. The patient is 7 weeks old. Would treatment endanger the sagittal sinus?

M.D., Montana.

ANSWER.—Freezing the skin by means of ethyl chloride for a brief period does not cause destruction of the skin. It does not compare with carbon dioxide snow in its ability to lower temperature and it is impossible to use pressure with ethyl chloride as with the snow. Without pressure a layer of gas forms below the snow and protects the skin, preventing adequate freezing for the purpose desired.

The snow is obtained by releasing liquid carbon dioxide into a chamois skin folded to make a bag. The sudden lessening of pressure allows the liquid to turn to the gaseous form so quickly that a great deal of heat is rendered latent and a small amount of liquid carbon dioxide is frozen. This snow is collected in a cylinder of the desired size and packed down by a ramrod. The warmth of the hand loosens the pencil of snow and it is removed from the cylinder and shaped on a flat surface of a heavy metal object like a flat iron. When of the right shape, it is pressed firmly on the lesion for from three to fifteen seconds, seldom longer in a baby, whose skin reacts more readily than that of an adult. The hair must be shaved from the scalp to get good apposition. Over a foundation of bone it is much easier to maintain pressure than on a soft surface as over the fontanel. It is not likely that there will be any injury to the sinus, for the effect of snow in this dosage is superficial. The fears of the mother must be considered, however. In treating a baby it is well to begin with a minimal dose and lengthen the time of freezing until sufficient to cause a bleb. This will probably burst and should be kept as clean as possible, by cleansing with hydrogen peroxide and dressing with sterile borated petrolatum. After healing the treatment can be repeated if thought advisable. Better results, with less scarring, are obtained from repeated small doses rather than a few large ones.

If the angioma is cavernous, radium treatment is preferred.

MYOTONIA CONGENITA (THOMSEN'S DISEASE)

To the Editor:—What is the treatment for myotonia congenita (Thomsen's disease)? In our hospital quinine hydrochloride is used for symptoms, but my case requires a minimum daily dose of 1 Gm. and the resulting tinnitus is worse than the disease. What is the etiology? Is it an endocrine or potassium-calcium imbalance or excess of acetylcholine?

ARTHUR GABLER, M.D., Illinois.

ANSWER.—Myotonia congenita (Thomsen's disease) is at present considered to be a disease of the muscle or myoneural junction. The etiology is unknown. Quinine is thought to be effective by destroying or preventing the action of the vagus stuff at the myoneural junction. In this respect it is supposed to act in a manner opposite to prostigmine in myasthenia gravis. In some cases there may be endocrine factors. This aspect should be investigated and if found the factors should be corrected.

Quinine hydrochloride is usually well tolerated by these patients. It may be well to try to establish tolerance with a total daily dose of 0.3 Gm. and then gradually increase the dose to the point at which the symptoms are controlled.

CHRONIC GONORRHEAL URETHRITIS

To the Editor:—A patient who has had a chronic posterior gonorrheal urethritis for many years has had about everything that has ever been utilized in the treatment of this condition. He has had several recurrences. In spite of weekly prostatic massages and the use of sounds for the past few months he continues to have a tickling sensation in the meatus. The latter symptom improved for a while after I began using sounds but it recurred a few weeks ago. Not knowing what else might be done for him, I am wondering whether sulfanilamide, which has been recommended so highly for a variety of infectious processes, might not be used. What dosage of sulfanilamide is given the first day or two, how much daily the rest of the time, how long should it be continued and should alkali be given with it?

M.D., Illinois.

ANSWER.—The presence of a tickling sensation in the meatus in the course of a chronic gonorrheal urethritis may be due to a narrowing of the meatus, a soft or hard urethral infiltration, a verumontanitis, granulation of the posterior urethra or a persistent prostatitis.

It may be necessary to do a small meatotomy to enlarge the meatus. The urethral caliber varies, but at least a No. 25 F. should be taken. Urethroscopy is indicated to ascertain a lesion of the verumontanum, which, if found, may be treated with increasing strengths of silver nitrate, beginning with a 1 per cent solution.

Prostatovesiculitis must be treated by massage and local instillation as well as by chemotherapy. It is best not to massage more often than one or two times a week.

The use of sulfanilamide in these cases is frequently of value. Dosage varies with age and general condition. The average ambulatory male will tolerate 2.6 Gm. (40 grains) a day for two or three days, with gradually decreasing dosage for a period of from two to three weeks only. Sodium bicarbonate 2.6 Gm. a day should be given with the sulfanilamide for the entire course of treatment. It is important to give no other medication with these drugs. Saline cathartics are especially contraindicated.

IMMUNITY IN GONORRHEA

To the Editor:—I should like information on immunology in its relation to gonorrhea.

JOSEPH N. SEGAL, M.D., Boston.

ANSWER.—There is little known at the present time about immunity and its relation to gonorrhea. Beyond any doubt some patients when infected with this organism will have a mild form of the disease and others will have a severe form. Experimentally it has been shown that the virulence of the numerous strains of gonococci varies greatly. This has been adequately tested as regards the thermal death point of the various strains. Clinically these facts are again brought out. Individuals known to be infected with the same organism usually respond in a similar way to treatment. No doubt personal immunity does play some part in gonorrhea but it seems to be slight.

TIME OF CIRCUMCISION—COAGULATION TIME IN NEWBORN

To the Editor:—What is the optimum time for circumcision of a newborn baby? Is the coagulation of the blood greater at birth than a few hours or a day or so later? If so, please give references to the literature.

M.D., Kentucky.

ANSWER.—According to the ancient custom, circumcision was performed on the eighth day after birth, though some tribes performed the rite at the second week. According to the custom of the present day, the operation is usually performed at the end of the first week after birth but is sometimes deferred to a week or ten days later.

The coagulation time of the blood in the newborn is prolonged for the first days of life, after which there is a decrease in the coagulation time, which reaches a level about the tenth day of life. At birth the coagulation time is nearly always at about the normal adult level but is prolonged somewhat in the presence of icterus. The greatest increase in coagulation time is noted on the third day of life.

References:

Lucas, W. P.; Dearing, B. F.; Hoobler, H. R.; Cox, Anita; Jones, Martha R., and Smyth, F. C.: Blood Studies in the Newborn, *Am. J. Dis. Child.* **22**:525 (Dec.) 1921.

Rodda, F. C.: Studies with a New Method for Determining the Coagulation Time of the Blood in the Newborn, *ibid.* **19**:269 (April) 1920.

SODIUM BICARBONATE DEPOSIT ON STERILIZER

To the Editor:—Without my knowledge my nurse had been placing a drachm of sodium bicarbonate in my sterilizer each day for several months, thinking that it prevented rust. Of course, this has affected all my syringes. We have thoroughly washed and scrubbed the sterilizer daily and have at times placed large amounts of boric acid solution in the sterilizer in an attempt to remove the remaining portion of sodium bicarbonate, but all this has been in vain. The syringes are always covered with a thin film of the powder as well as the sterilizer following drainage. Can you suggest other means of removing the powder?

M.D., Virginia.

ANSWER.—Washing in large amounts of distilled water should remove both the sodium bicarbonate and the boric acid from the sterilizer. However, a 1 per cent hydrochloric acid solution followed by rinsing well with distilled water should remove all traces of the sodium bicarbonate. This should be used with care in metal sterilizers. It is possible that the thin film on the syringes and sterilizer is salts from tap water and is not sodium bicarbonate.

BITTER SKIN FROM DRUGS?

To the Editor:—Will theobromine cause bitterness of skin and fingernails when taken over a period of time? My patient has also been taking digitalis and a salicylic acid compound. Would either of these drugs be a possible causative agent? If none of these drugs cause this symptom, what are some other possibilities?

M.D., Ohio.

ANSWER.—There is a possibility of dermal elimination of substances, such as alkaloids, although the matter has not been extensively investigated. Stockman in 1906 (*Edinburgh M. J.* **2**:103, 1906) found traces of salicyl in the sweat and Vinci (*Biochem. Zentralbl.* **4**:240, 1905) found salicyl in all organs and secretions; salicylic acid per se does not exist in tissues; buffer action prevents its occurrence as an acid. The condition of the skin may, of course, be due to elimination of the sweat of endogenously produced bodies and it may be well to investigate the condition of the kidney and of the alimentary tract if the condition persists in spite of discontinuance of the medicine.

SEPTIC TANK AND SURVIVAL OF BACTERIA

To the Editor:—I am planning a cabin in the north woods on an island. I should like information on the efficacy of a septic tank in relation to contamination of drinking water obtained from deep down in the Lake of the Woods approximately fifty feet from shore. I understand that if the liquid draining from the septic tanks is distributed under ground over a reasonably large area the bacteria contained become killed. Any information will be appreciated.

M.D., Illinois.

ANSWER.—It is not definitely known how rapidly pathogenic bacteria disappear in a septic tank. Although it is probable that these organisms do not survive any great length of time, they may appear in the effluent, particularly if circulation in the tank is relatively rapid. The movement of fecal pollution in ground water has been studied, with B. coli and the dye uranin used as indicators (Stiles, C. W., and Crohurst, H. R.: *Pub. Health Rep.* **38**:1350 [June 15] 1923). Pollution was found to penetrate a fine sandy soil for 115 feet in 187 days. The distance to which pollution may so penetrate is dependent on a number of interrelated factors, the most important of which are the ground formation, wet and dry weather with resulting rise and fall of the ground water level, the length of the wet and dry periods, the viability of the bacteria under the conditions of moisture, food supply and *p*H that may obtain. Laboratory experiments indicate that the typhoid bacillus may survive two or three weeks in unsterilized ground water.

EFFECT OF IODINE FUMES ON SKIN

To the Editor:—A man in Los Angeles is enthusiastic over a vaporizer in which he uses iodine crystals and sprays the fumes directly on the skin or other involved portions of the body, claiming that the iodine thus applied has a therapeutic effect not otherwise obtained. He advocates its use in carbuncles, boils, sore throat, acne and vaginitis. Is there any proved worth or merit in such a procedure?

M.D., Los Angeles.

ANSWER.—No. There is no possibility that the iodine fumes could have better effect than that which would be obtained when applied to the skin in equivalent concentration by other means.

ALUM IN DIPHTHERIA TOXOID

To the Editor:—Can you advise me of any diseases in which alum is given hypodermically? What would be the effects and what is the amount each patient receives that is given a dose of diphtheria toxin alum precipitated?

C. W. BESON, M.D., Oklahoma City.

ANSWER.—The quantity of alum in diphtheria toxoid alum precipitated does not exceed 20 mg. per dose. There is no likelihood that alum given hypodermically would be of any value in any disease. It would certainly be destructive to the subcutaneous tissue if employed in any considerable concentration. This is due to its protein precipitant quality, which is absent when it is used in diphtheria toxoid as the protein precipitant action has been neutralized in the formation of this product.

X-RAYS AND RADIUM IN MENORRHAGIA

To the Editor:—What effect will 100 mg. of radium applied to the uterus for six hours, or the equivalent of x-rays, have on the sexual desire and orgasm in a woman 35 years of age? Which would be better, radium or x-rays, to control menorrhagia (not pathologic but probably due to hypochromic anemia)?

M.D., Louisiana.

ANSWER.—There is every reason to believe that the insertion of 100 mg. of radium in the uterus for six hours in a woman 35 years of age has no effect on sexual desire and orgasm. There is little choice between the use of x-rays and radium in equivalent doses for the control of functional menorrhagia.

OBESITY AND HYPERTENSION—RACIAL INCIDENCE

To the Editor:—1. Is there any proved relationship between obesity and hypertension? 2. Is this country is there a racial difference in the incidence of hypertension?

M.D., Missouri.

ANSWER.—1. There is no proved etiologic relationship between obesity and hypertension, although at one time such was the general opinion. Hypertensive arterial disease and diabetes mellitus of the late type are, however, encountered frequently in the same individuals. This coexistence of the two diseases is more common among obese persons with diabetes. Obesity affects the prognosis in hypertensive disease adversely. There is greater cardiac strain and likelihood of earlier renal depreciation.

2. There are no well defined racial differences in the incidence of hypertensive disease. As this disorder is an exceptionally variable one and each case is individual, it is difficult and precarious to indulge in generalizations.

EXCESS HAIR OF CHEST

To the Editor:—A patient is desirous of removing thick matty hair covering more than three fourths of his chest. He is much embarrassed by this extreme hirsutism and has asked me as to the advisability of careful x-ray exposure or any other remedy.

M.D., New York.

ANSWER.—There is no safe way of permanently removing hair. Without any question hair can be removed by x-rays but it is not a safe procedure at the present time to attempt to remove hair permanently by this means. There are various mechanical and chemical methods of removing hair temporarily, but there are none which can be advised as thoroughly safe or permanent.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, Jan. 3-5 and June 20-22. Sec., Dr. J. N. Baker, 517 Dexter Ave., Montgomery.

ARIZONA: *Basic Sciences.* Tucson, Dec. 20. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Medical (Regular).* Little Rock, Nov. 3-4. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Medical (Eclectic).* Little Rock, Nov. 3. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Reciprocity.* Los Angeles, Nov. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: *Basic Sciences.* Denver, Dec. 7-8. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: *Medical (Regular).* Hartford, Nov. 8-9. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, Nov. 8-9. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Sciences.* Washington, Dec. 26-27. *Medical.* Washington, Jan. 9-10. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 14-15. Sec., Dr. William M. Rowlett, Box 786, Tampa.

INDIANA: Indianapolis, June 20-22. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 13-14. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 North 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 6-8. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 8-9. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical (Regular).* Baltimore, Dec. 13-16. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, Dec. 13-14. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 8-10. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-Y State House, Boston.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

NEBRASKA: Lincoln, Nov. 25-26. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 7-9. Sec., Dr. John E. Worden, Capitol Bldg., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. Fred E. Clow, State House, Concord.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 23-26. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity.* Raleigh, December. *Examination.* Raleigh, June 19. Sec., Dr. William D. James, The Hamlet Hospital, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 3-6. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 7-9. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Sciences.* Oklahoma City, Nov. 30. Sec. of State, Hon. Frank C. Carter. State Capitol Bldg., Oklahoma City. *Medical.* Oklahoma City, Dec. 14. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Basic Sciences.* Portland, Nov. 19. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 8. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 17-18. Director of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.

TEXAS: Houston, Nov. 14-16. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 14. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 14-16. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Bluefield, Oct. 31-Nov. 2. Sec., Public Health Council, Dr. Arthur E. McChee, State Capitol, Charleston.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 3. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 10-14. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and *Special Boards* were published in THE JOURNAL, October 22, page 1587.

Pennsylvania July Examination

Dr. James A. Newpher, secretary, State Board of Medical Education and Licensure, reports the examination held at Philadelphia and Pittsburgh, July 5-9, 1938. Four hundred and ninety candidates were examined, 487 of whom passed and three failed. The following schools were represented:

School	PASSED Year Grad.	Number Passed
College of Medical Evangelists	(1938)	1
Stanford University School of Medicine	(1937)	1
George Washington University School of Medicine	(1937, 8)	8
Georgetown University School of Medicine	(1936), (1937, 14)	15
Howard University College of Medicine	(1937, 3)	3
University of Georgia School of Medicine	(1933)	1
Loyola University School of Medicine	(1937), (1938, 5)	6
Rush Medical College	(1936), (1937, 3)	4
State University of Iowa College of Medicine	(1937, 2)	2
University of Kansas School of Medicine	(1928)	1
University of Louisville School of Medicine	(1937)	1
Johns Hopkins University School of Medicine	(1936), (1937)	2
University of Maryland School of Medicine and College of Physicians and Surgeons	(1937, 6)	6
Harvard University Medical School	(1936, 3), (1937, 2)	5
St. Louis University School of Medicine	(1937, 5)	5
Washington University School of Medicine	(1937, 2)	2
Columbia Univ. College of Phys. and Surgeons	(1935), (1936)	2
Cornell University Medical College	(1937)	1
New York University College of Medicine	(1937)	1
Duke University School of Medicine	(1936), (1937)	2
Eclectic Medical College, Cincinnati	(1936), (1937, 2)	3
University of Cincinnati College of Medicine	(1938)	1
Western Reserve Univ. School of Medicine	(1936), (1937, 2)	3
University of Oregon Medical School	(1936)	1
Hahnemann Medical College and Hospital of Philadelphia	(1936, 3), (1937, 69)	72
Jefferson Medical College of Philadelphia	(1935, 2), (1936, 19), (1937, 65)	86
Temple Univ. School of Med.	(1933), (1936, 11), (1937, 56)	68
Univ. of Pennsylvania School of Med.	(1936, 39), (1937, 44)	83
University of Pittsburgh School of Medicine	(1937, 60)	60
Woman's Med. College of Penna.	(1935), (1936, 2), (1937, 9)	12
Medical College of the State of South Carolina	(1936), (1937)	2
Baylor University College of Medicine	(1937)	1
University of Texas School of Medicine	(1936)	1
Medical College of Virginia	(1937, 4)	4
Dalhousie University Faculty of Medicine	(1937)	1
University of Toronto Faculty of Medicine	(1929)	1
McGill Univ. Faculty of Medicine	(1931), (1934), (1937)	3
Medizinische Fakultät der Univ. Wien	(1926, 3), (1937, 3)	6
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	(1927), (1936)	2
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1923), (1936), (1937)	3
Universität Rosch Medizinische Fakultät	(1924)	1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1936)	1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	(1936)	1
University of Glasgow Medical Faculty	(1933)	1
Universität Basel Medizinische Fakultät	(1935)	1

School	FAILED Year Grad.	Number Failed
Hahnemann Med. College and Hospital of Philadelphia	(1937)	1
University of Pennsylvania School of Medicine	(1936)	1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1936)	1

Forty-three physicians were licensed by reciprocity and nine physicians were licensed by endorsement from February 18 through September 12. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
Georgetown University School of Medicine	(1934)	New Jersey
Loyola University School of Medicine	(1935)	Indiana, New York
Northwestern University Medical School	(1928) (1930)	Michigan, Iowa
Rush Medical College	(1936)	Illinois
University of Illinois College of Medicine	(1924)	Illinois
State University of Iowa College of Medicine	(1932), (1936)	Iowa
University of Kansas School of Medicine	(1930)	Kansas
Johns Hopkins University School of Medicine	(1930)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons	(1929)	Ohio, (1937) Maryland
University of Minnesota Medical School	(1933)	Minnesota
University of Nebraska College of Medicine	(1920) (1928)	New York, Massachusetts
Columbia Univ. College of Physicians and Surgeons	(1932)	New York
New York Homeopathic Med. Col. and Flower Hosp.	(1925)	New York
Syracuse University College of Medicine	(1928), (1934)	New York
University of Cincinnati College of Medicine	(1934)	Ohio
Western Reserve University School of Medicine	(1934)	Ohio
Hahnemann Medical College and Hospital of Philadelphia	(1934) Maryland, (1932), (1937)	New Jersey
Jefferson Medical College of Philadelphia	(1931) N. Carolina, (1934) Ohio, (1917), (1932), (1936, 2) (1937)	New Jersey
Temple University School of Medicine	(1932) (1934) New Jersey, (1936) Connecticut, Utah	California,
University of Pennsylvania School of Medicine	(1931) (1933) New Jersey, (1934) New York	Delaware,
Medical College of the State of South Carolina	(1934)	S. Carolina
Medical College of Virginia	(1930)	N. Carolina
University of Virginia Department of Medicine	(1903) (1936) West Virginia	New Jersey,

School	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
College of Medical Evangelists	(1937)	N. B. M. Ex.
University of Michigan Medical School	(1932)	N. B. M. Ex.
Duke University School of Medicine	(1937)	N. B. M. Ex.
Jefferson Medical College of Philadelphia	(1932), (1934), (1937)	N. B. M. Ex.
Temple University School of Medicine	(1933)	N. B. M. Ex.
University of Pennsylvania School of Medicine	(1931)	N. B. M. Ex.
Woman's Medical College of Pennsylvania	(1935)	N. B. M. Ex.

Maryland June Examination

Dr. John T. O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held at Baltimore, June 21-24, 1938. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. One hundred and ninety-five candidates were examined, 179 of whom passed and sixteen failed. The following schools were represented:

School	PASSED Year Grad.	Per Cent
University of Southern California School of Medicine	(1938)	87
Yale University School of Medicine	(1936)	88
George Washington University School of Medicine	(1937)	82.2, 83, 83.5, (1938) 81.3, 84.4, 85, 86.5, 90.3
Georgetown University School of Medicine	(1938)	89.2
Howard University College of Medicine	(1938)	85
Loyola University School of Medicine	(1938)	84.5
Rush Medical College	(1937)	87.5
School of Medicine of the Division of Biological Sciences	(1937)	87.1
Johns Hopkins University School of Medicine	(1934) (1935) 81.4, (1937) 78, 81.1, 85, 86, 86, 89, (1938) 79, 79.5, 80, 80, 81, 82, 82, 82.1, 83, 83, 83, 83, 83, 83.1, 83.2, 83.3, 84, 84, 84, 84.1, 84.2, 84.5, 85, 85, 85, 85, 85.1, 85.1, 85.4, 86, 86, 86.2, 86.3, 86.5, 86.5, 86.5, 87, 87, 87.1, 87.2, 87.4, 87.6, 88, 88, 88.1, 88.2, 88.5, 88.5, 88.6, 88.6, 89, 89.2, 89.3, 89.6, 90.1, 91, 91.2, 91.3, 92.3	87.6,
University of Maryland School of Medicine and College of Physicians and Surgeons	(1937)	78.7, 84, (1938) 78.4, 80, 80, 80, 80.3, 80.5, 81, 81, 81.2, 82, 82, 82, 82.5, 83, 83, 83.2, 83.3, 83.4, 83.4, 84, 84, 84, 84, 84.3, 84.5, 84.6, 85, 85, 85.1, 85.4, 85.5, 86, 86, 86.2, 86.2, 86.4, 86.4, 87, 87, 87, 87.1, 87.1, 87.2, 87.4, 87.5, 87.6, 88, 88, 88.1, 88.2, 88.2, 88.3, 89, 89, 89, 89.1, 89.3, 89.4, 90.1, 90.3, 90.4, 90.4, 90.5, 91, 91, 91, 91, 92, 92.3, 94
Tufts College Medical School	(1937)	85.3
University of Minnesota Medical School	(1938)	87.4
Cornell University Medical College	(1938)	82.5
Long Island College of Medicine	(1936)	79
University of Rochester School of Medicine	(1934)	80, 85
University of Oklahoma School of Medicine	(1938)	84
Jefferson Medical College of Philadelphia	(1937)	84.1
Temple University School of Medicine	(1937)	85.5
University of Pennsylvania School of Medicine	(1937)	83
University of Virginia Department of Medicine	(1934)	81
University of Wisconsin Medical School	(1935)	81
Eberhard-Karls-Universität Medizinische Fakultät, Tübingen	(1936)	85.6
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1933)	79.5
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1924)	84.5
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1935)	80.5, 82.3
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1935) 77, (1936) 77.3, 77.4,	82
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1936)	81
Université de Genève Faculté de Médecine	(1936)	79.1

School	FAILED Year Grad.
George Washington University School of Medicine	(1937)
Meharry Medical College	(1938)
Medizinische Akademie Düsseldorf	(1932)
Universität Rostock Medizinische Fakultät	(1928)
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1937, 3)
Regia Università degli Studi di Catania. Facoltà di Medicina e Chirurgia	(1936)
Regia Università degli Studi di Firenze. Facoltà di Medicina e Chirurgia	(1932)
Regia Università degli Studi di Messina. Facoltà di Medicina e Chirurgia	(1936)
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1936)
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1935, 2), (1936)
Universität Basel Medizinische Fakultät	(1936)
Universität Zürich Medizinische Fakultät	(1937)

Twenty-three physicians were licensed by reciprocity and eight physicians were licensed by endorsement from January 20 through July 29. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
College of Medical Evangelists	(1925)	California
Georgetown University School of Medicine	(1926), (1935)	Dist. Colum.
Bennett Medical College, Chicago	(1913)	Ohio
Chicago College of Medicine and Surgery	(1916)	Illinois
Northwestern University Medical School	(1934)	Illinois
Rush Medical College	(1934), (1936)	Illinois
University of Illinois College of Medicine	(1930)	Illinois
Johns Hopkins University School of Medicine	(1933)	N. Carolina
University of Maryland School of Medicine and College of Physicians and Surgeons	(1927), (1929)	N. Carolina
St. Louis University School of Medicine	(1932)	Penna.
Washington University School of Medicine	(1930)	Missouri
Temple University School of Medicine	(1929), (1932)	Penna.
University of Pennsylvania School of Medicine	(1930)	Penna.
Baylor University College of Medicine	(1930)	Texas
University of Texas School of Medicine	(1936)	Texas
Medical College of Virginia	(1933)	Virginia
University of Virginia Department of Medicine	(1934)	Virginia
University of Toronto Faculty of Medicine	(1930)	New York
Leopold-Franzens-Universität Medizinische Fakultät, Innsbruck	(1936)	New York

School	LICENSED BY ENDORSEMENT Year Grad.	Endorsement of
College of Medical Evangelists	(1938)	N. B. M. Ex.
Yale University School of Medicine	(1934)	N. B. M. Ex.
Georgetown University School of Medicine	(1937)	N. B. M. Ex.
University of Louisville School of Medicine	(1936)	N. B. M. Ex.
Johns Hopkins University School of Medicine	(1934), (1935)	N. B. M. Ex.
University of Oklahoma School of Medicine	(1927)	N. B. M. Ex.
Temple University School of Medicine	(1936)	N. B. M. Ex.

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded to 517 applicants who were successful in the examinations in Part III held during June and July, 1938. The following schools were represented:

School	PASSED Year Grad.	Number Passed
University of Arkansas School of Medicine	(1936)	1
College of Medical Evangelists	(1935), (1936, 6), (1937, 9), (1938, 61)	77
Stanford University School of Medicine	(1936, 5)	5
University of California Medical School	(1937, 2), (1938)	3
University of Southern California School of Medicine	(1938)	1
Univ. of Colorado School of Med.	(1935), (1936, 3), (1937, 4)	8
Yale University School of Medicine	(1932), (1933, 2), (1934), (1935, 3), (1936, 10), (1937, 20)	37
George Washington Univ. School of Med.	(1936, 4), (1937, 6)	10
Georgetown University School of Medicine	(1934), (1935, 4), (1936, 12), (1937, 25)	42
Howard University College of Medicine	(1934), (1936)	2
Emory University School of Medicine	(1936, 2)	2
University of Georgia School of Medicine	(1937, 2)	2
Loyola University School of Medicine	(1937, 2)	2
Northwestern University Medical School	(1937), (1938, 9)	10
Rush Medical College	(1935), (1936), (1937, 8)	10
School of Med. of the Division of Biological Sciences	(1937, 6)	6
University of Illinois College of Medicine	(1937)	1
State Univ. of Iowa College of Medicine	(1936), (1937, 2)	3
University of Kansas School of Medicine	(1937, 2)	2
Tulane Univ. of Louisiana School of Med.	(1936, 2), (1937, 3)	5
John Hopkins Univ. School of Med.	(1934), (1935, 2), (1937)	4
Boston University School of Medicine	(1933), (1935), (1936, 6), (1937, 12)	20
Harvard University Medical School	(1931), (1933, 2), (1934), (1935, 5), (1936, 20), (1937, 7)	36
Tufts College Medical School	(1933), (1935), (1936, 8), (1937, 21)	31
University of Michigan Medical School	(1936, 2), (1937)	3
Wayne University College of Medicine	(1937)	1
University of Minnesota Medical School	(1931), (1936), (1937, 4), (1938, 3)	9
St. Louis University School of Medicine	(1937)	1
Washington University School of Medicine	(1933), (1935), (1936), (1937, 3)	6
University of Nebraska College of Medicine	(1936, 2)	2
Albany Medical College	(1935), (1937, 9)	10
Columbia University College of Physicians and Surgeons	(1936, 3), (1937, 2)	5
Cornell Univ. Med. College	(1934), (1935), (1936, 6), (1937, 5)	13
Long Island College of Medicine	(1937, 6)	6
New York Homeopathic Med. College and Flower Hosp.	(1933)	1
New York Med. College and Flower Hosp.	(1936, 8), (1937, 27)	35
New York University, University and Bellevue Hospital Medical College	(1933)	1
New York University College of Medicine	(1936, 2), (1937, 5)	7
Syracuse University College of Medicine	(1936, 2), (1937)	3
University of Buffalo School of Medicine	(1932), (1936)	2
University of Rochester School of Medicine	(1937)	1
Duke University School of Medicine	(1934), (1935, 6), (1936, 16), (1937, 13)	36
Western Reserve University School of Medicine	(1936)	1
University of Oklahoma School of Medicine	(1936), (1937, 2)	3
University of Oregon Medical School	(1934)	1
Hahnemann Med. College and Hospital of Philadelphia	(1935)	1
Jefferson Medical College of Philadelphia	(1936, 3), (1937, 4)	7
Temple University School of Medicine	(1937, 2)	2
Univ. of Pennsylvania School of Med.	(1932), (1936, 2), (1937)	4
Woman's Medical College of Pennsylvania	(1934), (1936)	2
Medical College of the State of South Carolina	(1936, 2)	2
Meharry Medical College	(1937)	1
University of Tennessee College of Medicine	(1936)	1
University of Vermont College of Medicine	(1934), (1937, 5)	6
Medical College of Virginia	(1937, 2)	2
Marquette University School of Medicine	(1934), (1936, 5)	6
University of Manitoba Faculty of Medicine	(1930), (1937)	2
Dalhousie University Faculty of Medicine	(1937, 2)	2
University of Toronto Faculty of Medicine	(1937)	1
McGill University Faculty of Medicine	(1936, 3), (1937, 4)	7
Medizinische Fakultät der Universität Wien	(1936)	1
West China Union University School of Medicine	(1936)	1
Regia Università degli Studi di Perugia. Facoltà di Medicina e Chirurgia	(1935)	1
University of Edinburgh Faculty of Medicine	(1936)	1

Book Notices

The Culture of Organs. By Alexis Carrel and Charles A. Lindbergh. Cloth. Price, $4.50. Pp. 221, with 110 illustrations. New York: Paul B. Hoeber, Inc., 1938.

This book illustrates the advances that may be expected in medicine when ample research funds make possible the collaboration on a single research project of experts in many different fields. The technic of cultivation of whole organs in the Lindbergh pump is described in detail, and the results of some of the cultures of whole organs are described and illustrated as proof of the efficiency of the method. The description of the construction, principle, manner of assembly, inspection and operation of the apparatus are by Charles A. Lindbergh. The description of the perfusing mediums, the preparation of operating material and antiseptic solutions are borrowed from the book by R. C. Parker, Methods of Tissue Culture (New York, Paul C. Hoeber, Inc., 1938). The introduction and chapters on preparation of organs and anatomic regions and on behavior of organs outside the body and the conclusions are by Alexis Carrel.

The principle of the method is the forcing of a pulsating stream of sterile perfusion medium through the artery of the excised organ and out through the veins by pulsating gas pressure. The sterile fluid is filtered through platinum filters and sand and returns through an equalization chamber to the reservoir chamber of the perfusion pump, from which it is pumped again through the organ. The apparatus used is mechanically ingenious but extremely complex and, in its present state of perfection, obviously expensive to construct and practical to operate only when the collaboration of a highly skilled surgical team, mechanic, glass blower, biochemist and technician is possible. The authors give credit to fourteen skilled assistants in the preface of the book. The apparatus permits control of systolic and diastolic pressures, pulsation rates and maintenance of sterility during continuous circulation of as much as 400 cc. of perfusion medium over prolonged periods. The apparatus as now constructed will permit perfusion of a 200 mg. organ for as long as a week and as a result of changing organs from one perfusion pump to another a few organs have been kept alive in part for as long as from thirty to forty days. Most of the work has been done on cat thyroid tissue, but cat ovaries and testes, the hind leg of a guinea pig fetus, and various other small organs from cats, chickens and rabbits have also been cultured, as well as small fragments of human thyroid. The illustrations consist of photographs and diagrams of the apparatus, and black and white reproductions of photomicrographs of the tissues cultured and their controls. It is well printed and bound but, unfortunately, lacks an index. It should prove indispensable to any one wishing to repeat the authors' work, of value to any one doing tissue cultures, and of great interest to physicians and scientists who are interested in the fundamental problems of the nature and functions of living tissue.

The meticulous attention to detail evidenced throughout the book illustrates again the truth in the adage that "genius means an infinite capacity for taking pains."

Die "postvaccinale Encephalitis" nach amtlichen österreichischen Daten. Von Dr. Marius Kaiser, Ministerialrat im Bundesministerium für soziale Verwaltung, und Hofrat Dr. Julius Sappert, Universitätsprofessor in Wien. Paper. Price, 4.80 marks. Pp. 97. Vienna: Julius Springer, 1938.

This monograph is crowded with interesting epidemiologic and clinical observations. In 1801 and 1802 the official reports for Bohemia listed in a series of 10,090 vaccinations thirty-five cases of a central nervous system disease which today would be diagnosed as postvaccinal encephalitis. Between 1925 and 1935 240 cases of this complication with a mortality of seventy-three (30.4 per cent) were diagnosed in Austria. Although the malady had reached a low level in England and the Netherlands, forty cases were seen in 1933. It is noteworthy that the susceptibility for this complication is low during the first five years of life despite the large number of vaccinations. It reached its highest incidence in the age groups 7 to 9. A greater liability of the females is shown in the relationship of 113 males to 127 females. A seasonal predominance during May to July with a peculiar regional frequency for example in the Tyrol suggests a "locality factor" which may or may not be related to other postinfectional or primary forms of encephalitis. The authors could find no connection between the degree of the vaccinal reaction and the development of the complication. In fact, they believe that the disposition of the vaccinated and not the quality of the vaccine lymph is of importance. Neurotropic properties were not demonstrable in the Austrian vaccinia. The "incubation time"—the period which elapsed between the vaccination and the symptoms of encephalitis—averaged 10.8 days. Predominantly an encephalitic process proved clinically and by forty-five carefully conducted necropsies, meningitic, myelitic and even bulbar types have been observed. Causal treatment with convalescent serum has been tried but no definite data are recorded. Under prophylaxis, the primary vaccination during the first year of life receives special emphasis.

A History of Dentistry. By Arthur Ward Luftin, D.D.S., Assistant Professor of Dental History in the College of Dentistry, University of Southern California, Los Angeles. Cloth. Price, $5.75. Pp. 253, with 90 illustrations. Philadelphia: Lea & Febiger, 1938.

The best chapter of this history is the first one, on the antiquity of dental disease, included in the section devoted to the first era, which covers the period up to the time of the Arabian invasion of Europe. Scant sixteen pages are devoted to the second era, entitled the Dark Ages. This is unfortunate, as herein is laid the foundation for the modern period, or third era. The material for this last period is assembled in three chief portions, entitled France, Great Britain and the United States. In these chapters too much attention is paid to legislation and education. The text is arranged for the most part in the form of short encyclopedic paragraphs and without much continuity of thought. The point of view of the last chapter, on the crystallization of a new concept of dentistry, is narrow and should either be eliminated or greatly modified. The author assumes that his readers will have a background inadequate to orient dental history with world history and therefore from time to time inserts material of a general character. The compilation of facts, data and bibliographic material apparently has been done with great care, as no noteworthy errors have been detected. It would seem that the author has missed a real opportunity to supply a greatly needed, condensed but adequate history of dentistry for use in schools and by persons interested in dentistry and its background.

Traité de pharmacie chimique. Par F. Lebeau, professeur à la Faculté de pharmacie de Paris, et G. Courtois, assistant à la Faculté de pharmacie de Paris. Tome I: Chimie minérale et chimie organique (série acyclique). Tome II: Chimie organique. Fascicule I: Série cyclique et terpénique, dérivés azotés acycliques et cycliques, vitamines et hormones, composés organo-minéraux; série hétérocyclique, matières colorantes, alcaloïdes, glycosides et albuminoïdes. Fascicule II: Série hétérocyclique, matières colorantes, alcaloïdes, glucosides et albuminoïdes. Second edition. Cloth. Price, Tome I, 250 francs; Tome II (2 fascicules), 400 francs. Pp. 1,300; 1,063; 1,041. Paris: Masson & Cie, 1938.

In spite of the size of this work the authors say it remains both a text and a reference book; that the student may find in the heads of chapters and in the principal articles all that corresponds to the program of instruction in chemical pharmacy given by the Faculty of Pharmacy in Paris.

The object of chemical pharmacy is the study of chemical elements and compounds used in therapeutics. The student should have adequate knowledge concerning their manufacture, origin of primary materials, process of preparation and national production. To show the rapid growth of chemical pharmacy they point out that the French Codex in 1837 contained 187 medical chemicals (galenicals excluded) while in 1937 it contains 355 and the extrapharmacopeial products in use number more than 2,000.

Volume I deals with inorganic, and the acyclic series of organic, chemistry. Commencing with hydrofluoric acid, which is described rather fully, the authors list sixteen fluorides and give their solubilities and the p_H of their saturated solutions. For the usages of sodium fluoride they say "It is used for the lavage of wounds, as a surgical antiseptic, for lavage of the bladder (1 in 500) and in obstetrics (1 in 600)." In discussing tin they say "Tin in the form of a powder is indicated as a vermifuge in dose of 10 to 15 grains." The pharmacology,

which is a secondary object, is definitely a weakness of the work. Under mercury, the addition of the metal itself, sixteen inorganic combinations and more than twenty of its organic compounds are described, and perhaps as many more organic compounds under the corresponding anions. This explains why the work is voluminous without the subjects being treated extensively. The acyclic series is rather fully described in the order usual in chemical textbooks. The whole volume has been carefully read and a list of errors (which are few) is given with corrections.

Volume II is divided into two parts: Part I deals with medicaments furnished by the cyclic series and terpenes, nitrogen derivatives acyclic and cyclic, and organic combinations with minerals. Vitamins and hormones are included in this part. As an indication of the inclusiveness of this work, they discuss the following salicylates: Na, Li, Mg, Zn, Cd, Al (basic), Hg (basic), Bi (basic), Ti (basic). The therapeutic uses of these are given. In addition to these they say that some therapeutic uses of the following have been established, for which they give the chemical formulas and solubility in water: K, NH_4, Ca, Ba, Fe, Ur, Pb and Cu. Part 2 includes medicaments furnished by the heterocyclic series, coloring matters, alkaloids, glucosides and albuminoids.

From the medical point of view it is deplorable that chemists and pharmacists feel they must include so many drugs of questionable value and that are quite unnecessary. Yet the practicing physicians are to blame. If physicians paid more attention and limited themselves to official or accepted drugs, pharmacy would be less onerous and quite as valuable. One gets the definite impression from this work that French chemistry and pharmacy are far superior to French pharmacology. Chemists and pharmacists accept statements of therapeutic uses that pharmacologists would reject as based on insufficient evidence. Again the inclusion of such therapeutic uses in a book on chemical pharmacy by prominent authors is accepted by many physicians and acts as a vicious circle to perpetuate the use of many drugs of little or no value.

As a reference book in medical chemistry, this work is reliable and has considerable value; but for American workers it is not indispensable. The references are numerous but not complete; the authors state frankly that this is a task almost impossible to realize. As a textbook it seems too voluminous for chemical pharmacy alone, yet it contains much extratopical matter that is decidedly valuable for general information and education. The student who masters its contents in a passable degree must have a wide knowledge of chemical pharmacy.

Fundamentals of Biochemistry with Laboratory Experiments. By Carl L. A. Schmidt, M.S., Ph.D., Professor of Biochemistry, University of California, and Frank Worthington Allen, Ph.D., Instructor in Biochemistry, University of California. Cloth. Price, $3. Pp. 268, with 39 illustrations. New York & London: McGraw-Hill Book Company, Inc., 1938.

As indicated in the title, this is a combination of textbook and laboratory manual. Naturally, considerable abbreviation is necessary to cover the subject matter in a book of this size. This is rather unfortunate, because the treatment of the discussions and laboratory instructions are frequently so condensed that the student no doubt is either forced to consult other textbooks or to repeat experiments in order to obtain correct results. The order of presentation appears irregular in part; thus, neutrality regulations in the body, enzymes, mineral metabolism, vitamins and the chemistry and functions of the endocrine secretions are discussed before the chemistry of the lipids, carbohydrates and proteins is considered. The chemistry of these cell constituents is discussed briefly and in an elementary manner and the laboratory treatment is equally condensed. Although the discussions on hydrogen ion concentration and neutrality regulation in the body are well presented, the experimental procedures for the measurement of hydrogen ion concentration and of alkali reserve in plasma are not adequately described. The modern manometric methods are not referred to. In the discussion on the effect of traces of carbonate in the titration of standard sodium hydroxide by standard hydrochloric acid it is stated that the pink color assumed by the phenolphthalein when the colorless solution is heated is produced by the carbonate ion. Why not say it is due to the hydrolytic dissociation of the sodium carbonate into sodium, bicarbonate and hydroxyl ions? It is difficult to explain why so unimportant a reagent as Barfoed's solution is described and used but no mention made of Fehling's solution, furfural reactions, imidazol reactions, ninhydrin, various amino acid reactions and the detection of phenols and hemoglobin. On the other hand the laboratory instructions emphasize more than usual the physiologic type of experiments, many of which are good but which can be satisfactory only when well conducted and of necessity therefore time consuming. The book closes with a valuable chapter on dietary data and illustrative problems in biochemistry.

An Introduction to Dermatology, with a Chapter on the Theory and Technique of X-Ray and Radium Therapy. By E. H. Molesworth, M.D., Ch.M., Lecturer in Diseases of the Skin, University of Sydney. Foreword by Professor Josef Jadassohn. Cloth. Price, $5s. Pp. 330, with 131 illustrations. London: J. & A. Churchill, Ltd., 1937.

Molesworth's textbook opens with a foreword by the late Prof. Josef Jadassohn, and the influence of his teachings is noted in the text. The discussion on allergic diseases embraces eczema, occupational diseases, urticaria and purpura. There is also a discussion of sensitization and desensitization with remarks on cutaneous testing, including patch testing. This entire section occupies fifty-seven pages. For some unexplained reason the author includes urticaria pigmentosa under the general heading of allergic diseases. The remarks on the treatment of the various described dermatoses are conservative and practical. The book is well illustrated, but the photographic reproductions, on the whole, do not compare in excellence with those in our better American textbooks. The section on radiation treatment is excellent and contains the fruit of the author's wide experience in the treatment of carcinoma of the skin, a condition occurring with great frequency in Australia. The author has attempted with considerable success to explain the simple physical problems of radiation treatment. This discussion is particularly recommended to dermatologists or to those who have occasion to treat superficial epitheliomas with x-rays. On page 389 there is confusion in the titles Schamberg's disease and Majocchi's disease. In this country progressive pigmentary dermatosis is considered to be Schamberg's disease and purpura annularis telangiectodes Majocchi's disease.

Central Narcotics Intelligence Bureau, Egyptian Government, Annual Report for the Year 1937. Paper. Price, P. T. 10. Pp. 304, with illustrations. Bulaq, Cairo: Govt. Press, 1938.

The first four chapters of this report deal with the results of the application of new narcotic laws in the apprehension and punishment of traffickers in opiates and hashish in Egypt. Many case reports are given showing the quantity of these drugs confiscated, the names and the nationalities of the offenders apprehended, and the sentences inflicted. Methods used by both traffickers in drugs and the agents who set about to apprehend them are given in some detail and do not differ materially from the methods used in other parts of the world. New legislation in Egypt provides severe punishment for the violation of the narcotic laws not only for natives but also for foreigners. This is something new in Egypt and has been a boon to the narcotic agents. There is also new legislation directed at drastic reduction in the cultivation of both hashish and opium poppies within Egypt.

It appears that Egypt's problem will be a difficult one because of the fact that most of the movement of illicit heroin from its sources to its several destinations must be through the Suez Canal, and the danger of smuggling portions of this drug into Egypt while en route constitutes a real source of danger to Egypt. There follow reports on the progress of several countries in the treatment of addiction and the reduction of international traffic in opium and hashish.

The next portion of the report is given over to tables delineating narcotics seized by coast guards, customs and police authorities on port steamers from Jan. 12, 1936, to Jan. 11, 1937, and tables showing a progressive reduction in seizures of hashish, manzoul, cocaine and heroin from 1929 through 1937, with a concomitant rise in the seizure of opium in the last year or so. Where it is possible to determine the source or origin of drugs seized, this information is noted in tables, listing the name of the offender, the quantity and the nature

of the drug, and the source. It appears that India is the chief source of hashish, followed by Syria, and that China furnishes much of the opium. The bulk of the heroin seized could not be traced to its source.

A study of the incidence of addiction revealed greater numbers near the Suez Canal and the Palestine frontier. Hashish is the drug of choice, followed by opium and heroin. Abundant tabular data give information on addicts and traffickers, their characteristics, convictions, social effects, methods, adulteration and profits.

Nutritional Physiology of the Adult Ruminant. By Ernest G. Ritzman, Research Professor in Animal Nutrition, New Hampshire Agricultural Experiment Station, and Francis G. Benedict, Director, Nutrition Laboratory, Carnegie Institution of Washington. Carnegie Institution of Washington Publication No. 604. Paper. Pp. 200, with 5 illustrations. Washington, D. C., 1938.

This volume presents portions of the results of fifteen years of cooperative research by the New Hampshire Agricultural Experiment Station and the Nutrition Laboratory of the Carnegie Institution. A large number of observations are summarized and discussed, providing a useful digest of current knowledge. Numbers of cows, steers, bulls, goats, sheep and horses were studied particularly from the point of view of energy exchange and diet utilization. The results are of practical as well as theoretical importance. One is impressed by the fragmentary knowledge of the physiology of domestic animals of economic importance, as compared with the more complete knowledge of dogs, cats, rabbits and rodents, which are the more usual laboratory animals. The need for more intensive study of the farm animals is made apparent. Fragmentary data on urine, feces, heart rate, respiratory rate and body temperature are given.

Standards for the Diagnosis and Treatment of Cancer. By the Executive Cancer Committee of the Iowa State Medical Society. Paper. Pp. 168. Iowa City, Iowa: Athens Press, [n. d.].

Admittedly for the purpose of reference on the part of the general practitioner, the cancer manual developed by the Executive Cancer Committee of the Iowa State Medical Society is practical, clear and concise. After a brief introduction in which the cooperation of medical and lay educational campaigns against cancer is urged, the authors take up briefly some general considerations. In this section, as throughout the manual, the language used is simple and avoids, so far as possible, complicated terminology. This is, of course, a valuable characteristic of the book from the point of view of the general practitioner. In cancer therapy as in most other branches of medicine there is a tendency to develop specialists. Valuable as the services of these highly trained men may be, there is also need of enlisting the support of the members of the profession who cannot restrict their practice to the field of malignant growths. To the latter group the manual should be of great assistance, for it presents for each location and type of cancer the early and late signs, the diagnosis and differential diagnosis, the treatment and the prognosis. There are two brief appendixes. The first deals with grades of malignancy as described in the clinic and pathologic laboratory. The second is a discussion of radiation therapy, a valuable section for those who desire to understand the simple major premises of this type of treatment. It would be splendid for cancer control for a copy of the Iowa manual to be in the hands of every new alumnus of our medical schools on graduation and on the desk of every general practitioner in the country.

Les éléments du pronostic dans les maladies aiguës: Notes de pratique. Par A.-B. Marfan, professeur honoraire à la Faculté de médecine de Paris. Paper. Price, 20 francs. Pp. 77. Paris: Masson & Cie, 1938.

This short treatise deals with practical clinical aids useful for prognosis in the acute febrile illnesses. Typhoid, the pneumonias, diphtheria, scarlet fever, endocarditis, pericarditis and meningitis are the diseases discussed. The book has little that is new. Such signs as pulse rate and character, the appearance of the tongue, presence or absence of abdominal distention, and the quantity of urine are the features stressed in discussion of pneumonia and typhoid. Many of the prognostic signs mentioned are of little value now, owing to new modes of therapy which have altered the course of these diseases, as serum therapy in pneumonia or sulfanilamide in meningitis.

Diagnostisch-therapeutisches Taschenbuch für den Chirurgen. Von Dr. med. Rudolf Gelmeroderfer, I. Assistent der Chirurgischen Universitäts-Klinik Breslau. Mit einem Geleitwort von Professor Dr. K. H. Bauer. Paper. Price, 16 marks. Pp. 500, with 150 illustrations. Leipzig: Johann Ambrosius Barth, 1937.

This is a new book and is written for the use of surgical residents and interns in the surgical services in hospitals. It is a practical work, intended for daily use, and presents an abundance of useful information in compact form, in a volume of such size that it can easily be carried in the pocket. The material covered includes information on diagnosis, indications for surgical treatment, and preoperative and postoperative management of the various surgical conditions. The diagnostic information includes and particularly presents the laboratory data on the urine and the blood, the x-ray appearances and the special diagnostic tests. The book is extremely practical and the material is strictly down to date, as is evidenced by the bibliography also, most of the references being to papers published since 1930. The author has succeeded in his goal, which was to present a work suitable as a textbook for the younger assistants, a welcome reference work for older surgeons, and a pocket sized book of reference for interns.

Medical Relief in Michigan—A Study of the Experience in Ten Counties. By Nathan Sinai, Marguerite F. Hall, V. M. Hogan, and Miriam Sloop. Paper. Pp. 148. Ann Arbor, Michigan: Edwards Brothers, Inc., 1938.

A detailed study of ten Michigan counties, based on a month by month analysis of all reports and statements, presents a valuable summary of many features of medical relief in Michigan. While the divergence of conditions and methods of administration made it difficult to give results applicable to all the counties, the tabulations of costs, services and all other features should be helpful to any one seeking to develop plans for medical care for the indigent. The divergences were so wide that in several instances two counties were excluded, and many of the conclusions are based on eight counties only. For these eight counties the total calls per illness averaged 1.9. "The median cost per person on relief in the eight counties during 1934" was $11.44. However, it is recognized that the records so tabulated did not actually include all costs, and therefore it is concluded that "if the total cost of medical relief, including all hospital care, is charged against the population on general relief, as a suggested method of estimating future costs," the results would be the following table:

Medical care (homes and offices)	$ 3.01
Medical care (hospitals)	3.88
Hospital	6.40
Dental care	.34
Nursing care	.50
Eye care	.19
Drugs	1.07
Surgical appliances, etc.	.11
Transportation	.06
Administration (10 per cent)	1.55
Total	$17.09

Step by Step in Sex Education. By Edith Hale Swift, M.D. Cloth. Price, $2. Pp. 207. New York: Macmillan Company, 1938.

This is not just another book attempting to gain the attention of the doctor and the parent. It is an excellent work that will serve both parent and physician. The physician who wishes to have constantly at his elbow a valuable aid to give to the perplexed parent will find this volume ideally suited for that purpose. The parent who wishes to improve his technic in answering the ever present questions of the child will find the answers to almost all the questions any child has ever asked. The book is divided into three parts: the first deals with sex in childhood, the second with puberty and its manifestations; the third presents the sexual aspects of adolescence through and into the preparation for marriage. The author presents excellent arguments for early sex education. That sex education should be continuous is well brought out in the various steps. Not all children will ask the questions that the mythical Bert and Jane in this book have asked, but the parent will find practically all the questions that children ask ingeniously and excellently, yet easily, explained. It is not a book to give to the child but rather a text for father and mother. The adolescent will enjoy reading the book for himself.

Die offene Lungentuberkulose bei Kindern und Jugendlichen: Ein Beitrag zur Frage Tuberculose und Konstitution. Von Professor Dr. Kurt Klare, Direktor der Tuberkulose-Kinderklinik Prinzregent-Luitpold Schelldegg-Allgäu, und Dr. Frieda Böhning. Paper. Price, 13.50 marks. Pp. 164, with 91 illustrations. Leipzig: Georg Thieme, 1938.

In this work the illustrations are mostly made from roentgenograms of chests. The authors have made an extensive study of tuberculosis among children and young adults. They call attention to the dangers of exposure to persons with open tuberculosis with reference to the development of first infections. They report eighty-five deaths from tuberculosis in the entire group under their observation. Only four of these deaths occurred among children under the age of 12 years and only two under the age of 11 years. Thus, their experience with reference to mortality beginning with the development of adolescence and thereafter is very similar to that reported in this country. Much emphasis is placed on other factors than the tubercle bacillus with reference to the development of clinical disease in young adults, for example, such factors as constitution and color of hair. Although many will disagree with the author's conclusions in this respect, the work is well worth reading since it contains a large amount of valuable data.

Syphilis, Gonorrhea and the Public Health. By Nels A. Nelson, B.S., M.D., F.A.P.H.A., Director, Division of Genitoinfectious Diseases, The Massachusetts Department of Public Health, and Gladys L. Crain, B.N., Epidemiologist, Division of Genitoinfectious Diseases, The Massachusetts Department of Public Health. Cloth. Price, $3. Pp. 350, with 9 illustrations. New York: Macmillan Company, 1938.

In the foreword the authors call attention to the fact that they have written this book for public health nurses, social workers and physicians. This idea has been carried out well in that the book contains much more technical information than the recent books on syphilis for the general lay reader. For this reason the volume is recommended highly not only to public health officials, both professional and lay, and to social service workers, but as a textbook for nurses and those who have more than a passing interest in the genito-infectious diseases, a term which the authors recommend. The technical features of the book are readily understandable and are couched in terms which are intelligible to the nonprofessional group. The authors give due credit for the source of the material and acknowledge the work of the Cooperative Clinical Group as a basis for the modern treatment of syphilis. The book is highly recommended as an authentic guide to those interested in the problem of syphilis and gonorrhea, both lay and professional workers, and it is of particular value to the lay group who work with patients having these diseases. The patient who is receiving treatment for syphilis would also find much of value in the book.

Diseases of the Skin for Practitioners and Students. By George Clinton Andrews, A.B., M.D., Associate Professor of Dermatology, College of Physicians and Surgeons, Columbia University, New York. Second edition. Cloth. Price, $10. Pp. 899, with 938 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

This is an excellent readable treatise on dermatology with numerous superb illustrations. There is a chapter on dermatoses due to vitamin deficiency, and the chapter on roentgen rays is excellently done and contains a wealth of practical and technical information. This chapter together with the one on radium and radon should be read by all dermatologists and by those who may use these agents in dermatologic therapy. The discussions on treatment are replete with prescriptions to aid the general practitioner in his attempt to treat cutaneous diseases.

Die Missbildungen und Anomalien der Nase und des Nasenrachenraumes. Von Dr. Walther Stupka, Privatdozent für Oto-Rhino-Laryngologie an der Universität in Innsbruck. Paper. Price, 36 marks. Pp. 319, with 153 illustrations. Vienna: Julius Springer, 1938.

There have been few books in recent years on congenital deformities, particularly in the field of laryngology. Stupka's work is therefore most timely. The author has made a thorough study of his subject and has painstakingly combed the literature for every bit of evidence that might help to bring it up to the minute. The book is divided into the following sections: I. The origin of malformations in general, which embraces studies of developmental errors from various causes, differential diagnosis between heredopathies and malformations not due to germinal factors, determination of the time factor in the origin of the malformation and the results of experimental teratology. II. Experiments on the embryo directed particularly toward influencing the development of the nasal apparatus. III. The malformations and anomalies of the nose. IV. The malformations and anomalies of the nasopharynx. Despite the complexity of the subject and the vast amount of material presented, the book is not difficult to read. To the research worker and the anatomist it should prove of inestimable value for reference. To the laryngologist who still retains some interest in embryology the book should provide interesting and valuable reading, for nowhere else can he find as complete a story of the rarer anomalies which are occasionally encountered as in this work. The illustrations are helpful and the bibliography a veritable mine of information.

Psychiatrie: Bildlinie, physiologisch et expérimentale; Clinique—Thérapeutique. Par H. Baruk, Médecin en chef de la Maison nationale de Charenton. Paper. Price, 220 francs. Pp. 837, with 125 illustrations. Paris: Masson & Cie, 1938.

This is not a textbook of psychiatry but a long personal report of the author's researches, his interpretations of the psychoses and his methods of treatment and, finally, remarks on the organization of psychopathic hospitals, particularly the National Hospital at Charenton, France, of which he is the physician in chief. Baruk has done extensive work on catatonia, psychoses with brain tumors and experimental convulsions. These and other papers appear in the first part of this volume. Then follow clinical cases from his wards, with methods of study and treatment. In the latter part of the book historical material is introduced, particularly on Royer-Collard, Bayle, Esquirol and other French psychiatrists who have worked at Charenton. Finally, the author gives some details regarding hospital administration. The book is well written and illustrated. The volume should be read by all physicians caring for patients with mental disorders. The account of Charenton will be appreciated by medical historians.

Agostino Bassi in the History of Medical Thought—A. Bassi and L. Pasteur—The Contagium Vivum Theory Throughout the Centuries: Aspects and Considerations. By Giovanni P. Arcieri, M.D. Paper read before the Medical Staff of the Parkway Hospital in New York at its meeting of February 23, 1938. Preface by Prof. Cesare Frugoni. Paper. Pp. 30, with portraits. New York City: Vigo Press, 1938.

The main purpose of this brief historical sketch is to forward the thesis that Spallanzani, Acerbi, Valli and especially Bassi were more important founders of the science of microbiology than were Pasteur or Koch. While some facts concerning their contributions, especially those of Bassi, are certainly not appreciated, the tendency to belittle the contributions of Pasteur, Koch and others is to be deplored and not in keeping with the true scientific spirit. The author has, nevertheless, contributed some interesting facts of historical importance to the subject.

A Synopsis of the Diagnosis of the Acute Surgical Diseases of the Abdomen. By John A. Hardy, B.Sc., M.D., F.A.C.S. Cloth. Price, $4.50. Pp. 345, with 92 illustrations. St. Louis: C. V. Mosby Company, 1938.

This is a small pocket sized textbook which deals empirically only with the diagnosis of the acute surgical conditions of the abdomen. It is written in clear, simple, concise style with the purpose of providing "quick, accurate, and complete means for the study of these urgent diseases." Beginning with chapters on surface localization of the abdominal organs, technic and importance of physical examination and hints for obtaining a detailed history, the ensuing thirty-eight chapters discuss the diagnosis and differential diagnosis of all possible abdominal emergencies briefly but completely. In addition, a few conditions the symptoms of which may cause diagnostic confusion, such as chronic cholecystitis, duodenal ileus, hemolytic jaundice and ureteral stricture, are included. Although all possible laboratory aids to diagnosis are discussed, special emphasis is placed on the importance of the history and physical observations in establishing the diagnosis. This book, written chiefly for the general practitioner who comes in contact with the greater portion of abdominal surgery, adequately fulfils its purpose.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Libel: Attributing Authorship of Medical Article to Physician Not the Author.—The defendant, the Ethical Publishing Company, published in its periodical, *American Medicine*, an article entitled "Therapeutic Uses of Colloidal Sulphur." It attributed the authorship of the article to the plaintiff, a physician, when in fact he neither wrote it nor had anything to do with its preparation or publication. The plaintiff brought suit for libel in the city court of New York, New York County, against the defendant company. The actual author of the article, a physician, was joined as defendant. At the trial, the defendant physician admitted he had prepared the article and had read the galley proofs before publication and that the plaintiff had refused to write an article on colloidal sulfur, because the plaintiff thought the time not yet ripe for a definite statement on its uses. The plaintiff claimed the article had held him up to ridicule and contempt among his friends and professional acquaintances.

The illegal and unauthorized use of the plaintiff's name in the published article, said the court, made the article libelous per se. The plaintiff considered the publication of the article contrary to professional ethics and he had refused to have his name associated with such advertising of colloidal sulfur. The advertising features of the article, in the judgment of the court, held the plaintiff up to severe criticism in his profession. He was an impressive witness in court and appeared to be sincere in the practice of his profession and imbued with the proper respect for medical ethics. The court concluded that the nature of the libel, the social and professional position of the plaintiff and the tendency of the article to injure him in public esteem entitled him to compensatory damages, which the court fixed at $250. Judgment for $250 was directed against the defendant Ethical Publishing Company, which was given judgment in the same amount over against the defendant physician who wrote the article.—*Gershwin v. Ethical Pub. Co., Inc., et al. (N. Y.), 1 N. Y. S. (2d) 904.*

Workmen's Compensation Acts: Trauma in Relation to Tuberculosis of Knee Joint and Lungs.—Nyberg was employed by the defendant corporation. He was 53 years old and had led an active life. The published record does not show affirmative evidence of any illness prior to the accident under which this case arose but does show affirmatively that he had no disorder of his left knee until after the accident. On Nov. 16, 1926, Nyberg, in the course of his employment in one of the defendant's quarries, was in a squatting position, holding with both hands the handle of a "bull set," a tool used in cutting and trimming stones. This tool, as was customary when it was in use, was being struck repeatedly with a sledge-hammer by a fellow workman. One of the blows jarred the handle of the tool and jerked Nyberg's left elbow, which was resting on his left leg near the knee, and a stinging sensation in the knee followed. Nyberg rubbed the knee for a few moments and then resumed work. During the next few days he suffered from pain and numbness in the knee. The pain became progressively worse, and four or five days after the accident the knee became swollen and discolored.

Nyberg consulted a physician, who diagnosed his condition as "water on the knee" and proposed an operation. After treatment by hot water applications and iodine had failed, an operation was performed Dec. 16, 1926. The condition of the knee was then diagnosed as "an acute stage of traumatic bursitis." The operation did not produce much improvement. In 1928 a physician diagnosed Nyberg's trouble as "a low-grade inflammatory reaction" and another diagnosed it as "a low-grade infectious arthritis." Between March 1927 and March 1930 Nyberg worked for short periods for the defendant and other granite companies but after the latter date was unable to work. Early in 1933, somewhat more than six years after the accident, roentgenograms disclosed "a definite destruction of the knee joint and cartilage" and "a cold abscess, in the popliteal space." In April 1933 tubercle bacilli were found in the sputum. Roentgenograms made shortly thereafter showed an advanced stage of pulmonary tuberculosis and tuberculosis of the left knee joint. In August 1933 Nyberg's left leg was amputated above the knee joint. Thereafter he remained in a tuberculosis sanatorium until his death in March 1935.

For seven weeks after Nyberg was injured his employer paid him compensation and paid his medical and hospital expenses. When he refused to pay further compensation and medical expenses, Nyberg instituted proceedings under the Minnesota workmen's compensation act against the employer and its insurance carrier. After his death his widow was substituted as claimant. From an award by the industrial commission granting her compensation and dependency benefits, the employer and its insurer appealed to the Supreme Court of Minnesota.

Eleven medical experts had testified in the proceedings before the case came to the Supreme Court. Both sides agreed that tuberculosis of a joint is an infection secondary to tuberculosis of the lungs. Evidence proving the presence of a dormant tuberculous infection of the knee at the time of an injury therefore proves, the Supreme Court reasoned, that the injured person had a tuberculous infection of the lungs at some earlier time. In the present case, said the court, there was considerable evidence to show that the tuberculous infection of the lungs had been arrested and was dormant when the accident to the knee occurred and that the infection of the lungs was lighted up or activated by the activation of the tuberculous infection in the knee that resulted from the accident. Such activation of the infection of the lungs may have resulted, according to several of the medical witnesses, either from a lowering of Nyberg's resistance or from a release of bacilli and toxins into his blood stream, by the actively diseased knee joint. All experts agreed that a dormant tuberculous infection might be present in the knee and be aroused into activity by a slight trauma. But while the medical experts for the claimant were of the opinion that there was a dormant tuberculous infection in Nyberg's knee when the accident occurred, which was activated by the accident, the medical experts testifying on behalf of Nyberg's employer believed that the tuberculous condition in the knee was merely a coincidence and had no causal relation to the injury.

The fact that the tuberculosis of the knee was not recognized for several years after the accident might seem to prejudice the case of the claimant. From the time of the injury until the time when tuberculosis was first diagnosed several years later, however, there was an undisputed history of a serious condition of the knee, which became progressively worse; an unbroken sequence of symptoms manifested themselves throughout this period. This gave strong support to the conclusion that the tuberculous infection became active at the time of the injury or shortly thereafter and had a direct connection with it. The rapidity of the development of tuberculosis and of the appearance of clinical symptoms after a traumatic activation of a latent tuberculous condition, said the Supreme Court, varies with the individual injured and depends to a large extent on his general resistance and on the virulence of the infecting germs. The development in some cases is prompt and rapid, in others it extends through a period of months or years. The evidence, said the court, leads to the inference that the tuberculous infection in Nyberg's knee became active about the time he was injured.

The evidence in the case justified the conclusion, said the Supreme Court, that Nyberg's tuberculous knee joint aroused into action the germs of tuberculosis that lay dormant in Nyberg's lungs and thus caused his death. A finding of a causal relation between the tuberculous knee joint and the injury sustained by Nyberg in the course of his employment was justified by competent evidence. Responsibility for his illness and death therefore rested on his employer under the workmen's compensation act.

On behalf of the employer, however, it was contended that the claim of Nyberg's widow was barred by the statute of limitations. The commencement of proceedings by an employee, however, said the Supreme Court, is notice that a claim is being made and, if it is valid, that a claim will also exist in favor of the defendants if death results from the injury. Notice that the accident is claimed to be of compensable nature, which the employer receives within the required time, is all the protection

which the six year limitation provisions of the Minnesota statute intend to give and to which the employer is entitled. Proceedings by the dependent survivor after an employee's death are not new, separate and distinct proceedings but are merely a reopening or continuation of the proceedings commenced by the employee.

The Supreme Court affirmed the award of the workmen's compensation commission in favor of the claimant.—*Nyberg v. Little Falls Black Granite Co. et al. (Minn.), 277 N. W. 536.*

Harrison Narcotic Act: Error in Physician's Narcotic Record not per se a Crime.—Section 1044(a) of the Harrison Narcotic Act, U. S. C. A., title 26, chapter 12, declares it to be unlawful for any one to sell, barter, exchange or give away any narcotic drug except in pursuance of a written order. Section 1044(c) of that act, however, authorizes the dispensing or distribution of narcotic drugs, without written orders, to patients, by a physician registered under the act, in the course of his professional practice, provided he keeps a record of all drugs within the coverage of the act that he dispenses or distributes, except such "as may be dispensed or distributed to a patient upon whom such physician, . . . shall personally attend." Furthermore, U. S. C. A., title 26, chapter 25, section 1693(a) (A) makes it unlawful to simulate or falsely or fraudulently execute or sign any entry or other document required by the internal revenue laws or by any regulation made in pursuance thereof. The defendant, a practicing physician, was convicted in the United States district court for the district of Colorado of violating both of the sections named, under a charge that he unlawfully sold, dispensed and distributed morphine to persons unknown, not in pursuance of written orders, and unlawfully, falsely and fraudulently simulated, executed and signed a narcotic record showing the amount of narcotic drugs dispensed and distributed and the names and addresses of patients to whom such drugs had been distributed. From this conviction, the defendant appealed to the United States circuit court of appeals, tenth circuit.

The conviction of the defendant physician was based on the following evidence. On Jan. 13, 1936, a federal narcotic agent seized the defendant's narcotic records and held them until the trial. Those records indicated that on Jan. 8, 1936, the defendant dispensed to "G. Hagen" twelve capsules and four ounces of a cough mixture. The capsules contained among other things one-half grain of morphine sulfate, apparently in each capsule. The cough mixture contained one grain of morphine sulfate, a half drachm of paregoric and an ounce of syrup of white pine, but whether in the ounce or in four ounces the published record does not show. According to the testimony of a Mrs. Frances Hagen, to whom the entry "G. Hagen" apparently referred, no narcotic drugs were dispensed to her on the date stated. It was shown, however, that Mrs. Hagen and a Mrs. Whalen, who was suffering from influenza, arrived at the defendant's office about the same time, that he excused himself from Mrs. Whalen's presence in order to receive a payment from Mrs. Hagen on her account, that after Mrs. Hagen's departure he dispensed to Mrs. Whalen twelve capsules containing morphine and four ounces of cough medicine such as are described above and that he entered them in his records under the name of Mrs. Hagen. There were certain discrepancies, too, in the records of the defendant's treatment of a Mrs. Smith after surgically removing a sliver from her hip. Mrs. Smith testified that the defendant gave her a narcotic drug on her second visit on January 3 and again on January 4. The defendant, however, testified that he dispensed a narcotic drug to Mrs. Smith to relieve pain on her first visit, January 1, and again January 4. Their testimony differed also as to the form in which the narcotic drugs were dispensed and the number of doses dispensed. The defendant's testimony, however, was corroborated by his narcotic record.

The defendant's dispensing of narcotic drugs to Mrs. Smith, said the circuit court of appeals, was a dispensing of such drugs to a bona fide patient with an injury, to relieve pain. Whether the drugs were delivered on the first and fourth or the third and fourth days of the month was not important. The defendant physician should not be made to enter a felon's cell simply because a woman's unsupported memory disagreed with his recollection, corroborated by his written record as to the dates he served her in her distress. In the judgment of the court the drugs had been dispensed in good faith by a physician in the course of his professional practice under conditions under which, as provided in the Harrison Narcotic Act, a written order is not necessary. The dispensing of narcotic drugs by a physician to a patient does not constitute a violation of section 1044(a) of the Harrison Narcotic Act.

Although the defendant's entries in his records under the name of "G. Hagen" do not truly reflect what happened, there was, said the court, an actual illness on the part of a Mrs. Whalen and a bona fide delivery of narcotic drugs to her for treatment of her ailment, as the law permits. Had there been no injury or illness and no patient and had the government been in some manner cheated, there might be cause for complaint. However, continued the court, when, as in the instant case, there is a record of narcotic drugs dispensed to sick persons who need and actually receive such drugs, resulting in the alleviation of their suffering, then we go far afield in an attempt to enforce the law by blasting the future of a professional man on such evidence. The law requires that a verdict of guilty be based on more than merely some evidence; it demands that it be based on substantial evidence. In this case the substantial evidence was as consistent with innocence as with guilt. The evidence failed to support the charge that the defendant had unlawfully sold narcotic drugs to persons unknown. The making of false records did not raise a presumption, as the government assumed, that the narcotic drugs falsely recorded were sold by the defendant to some one else. The defendant could still have the narcotic drugs or he could have dispensed or administered them not unlawfully in the course of his professional practice.

In the judgment of the appellate court the trial court should have directed a verdict of acquittal, because there was no substantial evidence of a violation of the law. The appellate court held further that the trial court had committed an error prejudicial to the defendant when it admitted in evidence the testimony of a witness for the government that two individuals who had been sentenced for drug addiction had been seen to visit the defendant's office on various occasions. The court also censured the prosecution for its improper cross examination of a physician imputing a narcotic charge to the witness, who had testified as a character witness for the defendant. Accordingly, the circuit court of appeals reversed the judgment and remanded the case.—*Towbin v. United States, 93 F. (2d) 861.*

Workmen's Compensation Acts: Services of Medical Expert Witnesses Not "Medical Services."—The workmen's compensation act of Louisiana requires the employer to furnish to injured employees "reasonable medical, surgical and hospital services." In a proceeding under that act a workman requested that five medical expert witnesses, whom he had hired to examine him and testify at the trial, be paid their fees of $25 each, because their services constituted "medical services" within the meaning of the act. In denying the workman's request, the Supreme Court of Louisiana said that "medical services" as used in the workmen's compensation act refers to medical services in the nature of attention and treatment administered to injured employees and not to the services of medical expert witnesses called for purposes of litigation.—*Jones v. Hunsicker et al. (La.), 177 So. 576.*

Society Proceedings

COMING MEETINGS

American Society of Tropical Medicine, Oklahoma City, Nov. 15-18. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
Central Society for Clinical Research, Chicago, Nov. 4-5. Dr. Lawrence D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
Inter-State Postgraduate Medical Association of North America, Philadelphia, Oct. 31-Nov. 4. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
Pacific Coast Society of Obstetrics and Gynecology, Los Angeles, Nov. 30-Dec. 3. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
Radiological Society of North America, Pittsburgh, Nov. 28-Dec. 2. Dr. Daniel S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
Southern Medical Association, Oklahoma City, Nov. 15-18. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.
Southern Surgical Association, White Sulphur Springs, W. Va., Dec. 6-8. Dr. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
Western Surgical Association, Omaha, Dec. 2-4. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

8: 97-132 (Sept.) 1938

Brucellosis (Undulant Fever): A Public Health Problem. Alice C. Evans, Washington, D. C.—p. 97
Early Surgical Intervention in Acute Cholecystitis. R. A. Hamrick, Birmingham.—p. 98.
*Study of Blood Bromide. Georgia L. Johnson, foreword by W. D. Partlow, Tuscaloosa.—p. 105.
Obstructions of Ureter. A. L. Atwood, Birmingham.—p. 107.

Blood Bromide.—In the Bryce Hospital Laboratory, according to Johnson, a quick and simple qualitative test for blood bromide is done by dropping 0.5 per cent solution of acid brown gold chloride into tubes containing serums left over after the complement fixation test has been set up. Familiarity with the changes in color produced in the presence of bromide in the serum enables one to pick up relatively small quantities of bromide—even as low as 25 mg. per hundred milliliters of blood. The serums showing an appreciable amount of bromide are subjected to a quantitative analysis. The principles of the method involve the preparation of a protein free filtrate by coagulation with trichloroacetic acid, and the addition of the gold chloride solution to the filtrate producing changes in color (due to the formation of gold bromide) varying from a yellowish brown to a reddish brown. This corresponds to the concentration of bromide. A high proportion of persons having nervous and mental disorders are given bromide more or less as a routine. Toxic symptoms develop in a little more than one out of five (based on 1,243 tests). The more widespread use of a quantitative test for bromide in the blood in all hospitals and clinics will result in a better knowledge of bromide therapy and a more complete understanding of its misuse.

American J. Digestive Diseases, Huntington, Ind.

5: 405-460 (Sept.) 1938

Vitamins in Relation to Gastrointestinal Diseases. M. G. Vorhaus, New York.—p. 405.
Studies on Parallel Action of Vitamin C and Calcium. S. L. Ruskin, New York.—p. 408.
Passage of Gallstones Through the Sphincter of Oddi. Marie Ortmayer and Margaret Austin, Chicago.—p. 411.
Infra-Red Photography of the Abdominal Wall in Portal Cirrhosis of the Liver. I. R. Jankelson and H. Baker, Boston.—p. 414.
Efficiency of Several Germicides and Antiseptics on Oral Mucosa. Esther Meyer and L. Arnold, Chicago.—p. 418.
Primary Carcinoma of the Liver. A. Levitt and D. S. Levy, Buffalo.—p. 420.
*Use of Hydrated Magnesium Trisilicate in Peptic Ulcer: Preliminary Report. M. Kraemer, Newark, N. J.—p. 422.
Variations in Level of Serum Lipase in Experimental Pancreatitis. H. Baxter, S. G. Baxter and J. F. McIntosh, Montreal.—p. 423.
Cod Liver Oil per Rectum as an Adjunct in Treatment of Ulcerative Colitis. R. R. Bust, Omaha.—p. 426.
Relationship of Diet to Self Regulatory Defense Mechanism: I. Hydrogen Ion Concentration and Bacterial Flora. N. P. Sullivan and I. A. Manville, Portland, Ore.—p. 428.
Health and Nutrition of High Andean Indians. C. W. Lieb, New York.—p. 432.

Hydrated Magnesium Trisilicate in Peptic Ulcer.—Kraemer has used hydrated magnesium trisilicate in the treatment of thirty-eight patients having roentgenologically proved duodenal ulcers associated with definite hyperacidity to a test meal and typical symptoms. The drug has been used by the patients for from three to six months. The patients were ambulant. They received three light meals daily and a glass of milk, milkshake or tea between meals and in the evening. One hour after meals and one hour after the between meal feedings and at bedtime they were given a teaspoonful of the powder. Some bromide or phenobarbital was given if there was excessive nervousness or sleeplessness. Some of the patients also received tincture of belladonna. If there was nocturnal pain the patients set their alarm clocks one hour before the anticipated period of distress and took a teaspoonful of the powder at that time. Some of the patients had had recurrences of symptoms for many years and had had many types of treatment. The symptoms of all the patients improved. In order to control psychic factors the patients were not told that they were receiving a new preparation. Intestinal habits were not affected. The author believes that the compound merits further trial.

American J. Obstetrics and Gynecology, St. Louis

36: 363-544 (Sept.) 1938. Partial Index

Fetal Respiration in Relation to Atelectasis and Intra-Uterine Pneumonia. F. F. Snyder and M. Rosenfeld, Baltimore.—p. 363.
Visceral Allergy. J. R. Goodall and R. M. H. Power, Montreal.—p. 372.
*Evaluation of Sedimentation Test in Differential Diagnosis of Acute Pelvic Inflammatory Disease and Acute Appendicitis. C. Lintgen and K. Fry, Philadelphia.—p. 393.
The Management of Breech Deliveries: Based on Report of 709 Cases from the Philadelphia Lying-in Hospital. R. W. Mahler, Philadelphia.—p. 400.
The Cold Pressor Test in Pregnancy. W. J. Diedemann, H. L. Michel and P. W. Woodruff, Chicago.—p. 408.
Heart Disease Complicating Pregnancy: Study of 436 Cases. H. J. Stander, New York.—p. 413.
Infant Mortality at the Cook County Hospital Among 16,000 Deliveries. D. S. Hillis and S. J. Rosenbaum, Chicago.—p. 427.
Activation of Uterine Muscle by Estrin and Its Relation to Uterine Growth. S. R. M. Reynolds, Brooklyn.—p. 437.
*Surgical Treatment of Dysmenorrhea. J. C. Masson and Rosemary Shoemaker, Rochester, Minn.—p. 441.
Hyperemesis Gravidarum: Clinical Study of 396 Cases. J. E. Fitzgerald and Augusta Webster, Chicago.—p. 468.
*Relationship of Oral Thrush to Vaginal Mycosis and Incidence of Each. P. W. Woodruff and H. C. Hesseltine, Chicago.—p. 467.
Study of 738 Cases of Uterine Bleeding in Conditions Other Than Pregnancy. F. Weintraub, Brooklyn.—p. 476.
Maternal Intracranial Hemorrhage Complicating Labor. H. L. Moskowitz and H. Schneider, New York.—p. 488.
Pathologic Properties of Meconium. W. H. Rubovits, E. Taft and F. Neuwelt, Chicago.—p. 501.
Aplasia of Lower Female Genital Tract. C. A. Elden, Rochester, N. Y.—p. 507.
Segmental Torsion of Fallopian Tube in a Young Virgin. S. A. Wolfe and D. Kupperstein, Brooklyn.—p. 509.

Sedimentation Test in Inflammatory Diseases.—In determining the value of the sedimentation test as a diagnostic aid in differentiating between acute pelvic inflammatory disease and acute appendicitis Lintgen and Fry performed the test on thirty patients with pelvic inflammatory disease and 100 patients with acute appendicitis. In 90 per cent of the thirty patients with acute pelvic inflammatory disease, the sedimentation of the erythrocytes was more rapid (between 11 and 40 mm. in one hour) than normal. In 52 per cent of the patients with acute appendicitis, the sedimentation rate was abnormal but not as rapid as in the acute pelvic inflammatory group. The authors do not agree with the reports of some observers that the sedimentation rate is never abnormal in acute appendicitis unless rupture or abscess formation has occurred; on the other hand their observations are quite in accord with those of others in regard to the sedimentation rate in acute pelvic inflammatory disease. Their conclusion is that the test by itself cannot be relied on to differentiate between the two conditions, since in practically half of the patients suffering with acute appendicitis sedimentation was abnormal.

Surgical Treatment of Dysmenorrhea.—Masson and Shoemaker sent follow-up letters to 128 patients who underwent operation for the relief of dysmenorrhea. Thirty-four patients were not heard from; therefore the state of the patient's health is known one or more years after operation in ninety-four. Frequently one or more surgical procedures (resection

of the presacral nerve, dilation and curettage, hysterectomy and the like) were done at the one operation, depending on the pathologic condition which was present. Complete relief was experienced by twenty-nine patients, some benefit was obtained by forty-three patients, and twenty-two of the patients did not experience any relief. Fourteen patients in whom hysterectomy was performed still complain of some pain which can be attributed to a tender ovary in some of them. The only procedure that produced uniformly poor results was the insertion of the Baldwin tube, but this procedure has since been discarded.

Oral Thrush and Vaginal Mycosis.—In order to determine the relationship of the sporadic cases of oral thrush in the newborn to vaginal mycosis in the mother, and the general incidence of each, Woodruff and Hesseltine carried out routine vaginal cultures on 402 women in the third trimester of pregnancy. Also ninety babies with positive oral thrush were studied with relationship to mycoses in their mothers. The incidence of fungi in the genital tract of the mothers appears to be associated with the economic and hygienic level. Babies born of such infected mothers have about a thirty-five times greater chance of developing oral thrush than infants born of noninfected mothers. The incidence of fungi in the vaginal tract was 28 per cent. Indigent Negro patients show an incidence of 41 per cent, indigent white patients an incidence of 33 per cent, while the more hygienic class of white patients shows an incidence of 14 per cent. Among 14,640 consecutive babies delivered at the Chicago Lying-in Hospital the incidence of oral thrush was found to be 0.6 per cent (ninety cases). However, in the last 6,130 babies of this total number the incidence of oral thrush was about 1 per cent. This apparent increase is believed to be the result of more careful observations.

American Journal of Ophthalmology, St. Louis

21: 963-1082 (Sept.) 1938

Biologic Frontal Flaps in Ophthalmology. J. F. S. Esser, Monaco.—p. 963.
*Effects of Oxygen Deprivation on the Central Visual Field. J. N. Evans, Brooklyn, and R. A. McFarland, New York.—p. 968.
Evaluation of Orthoptic Training for Aviators. A. H. Schwichtenberg, Dayton, Ohio.—p. 980.
Inflammatory Pseudotumor of the Orbit: Report of Case. P. M. Lewis, Memphis, Tenn.—p. 991.
Chloroma: Report of Case with Hematologic Study. A. D. Frost, Columbus, Ohio.—p. 997.
Applied Mechanics of Cataract Extraction. E. Jackson, Denver.—p. 1011.
Papillary Type of Beal's Conjunctivitis. P. Thygeson, New York.—p. 1017.
The Use of Paredrine in Cycloplegia. I. S. Tassman, Philadelphia.—p. 1019.
Evaluation of Visual-Testing Methods in Schools: Preliminary Report. J. B. Hitz, Milwaukee.—p. 1024.

Oxygen Deprivation and Visual Fields.—Evans and McFarland conclude from thirty-six experiments on eight eyes of four subjects under conditions of oxygen deprivation that (1) central visual acuity remained unaffected, even at the peak of oxygen deprivation; (2) the angioscotoma widened progressively with progressive oxygen deprivation until it obliterated the visual field, except for a region of from 8 to 10 degrees about the macula; (3) there seemed to be no relation between the minor changes occurring in the blood pressure and the angioscotoma, and (4) there was a marked variation in the extent and rate of widening of the angioscotoma, not only between individuals but also to a lesser degree in one eye as compared to the other eye of the same individual. By placing a patient under the stress of oxygen deprivation, latent defects in the retina may become apparent. In numerous conditions associated with venous stasis, widening defects of the angioscotoma identical in form and extent to those created in the present experiments have been eradicated by the administration of drugs—ephedrine sulfate—which cause vasoconstriction and a rise of blood pressure. The administration of similar medication might be used to overcome the visual and cerebral effects of anoxia in avistors.

American Journal of Physiology, Baltimore

122: 543-808 (Sept.) 1938. Partial Index

Effects of Intra-Arterial Epinephrine on Blood Flow in an Extremity. N. W. Roome, Chicago.—p. 543.
Acid-Base Balance of Blood Serum in Hyperthermia. W. H. Danielson, R. M. Stecher, E. Muntwyler and V. C. Myers, Cleveland.—p. 550.
Observations on Creatinine and Urea Clearances, on Responses to Water Ingestion and on Concentrating Power of Kidneys in Normal, Diabetes Insipidus and Hypophysectomized Dogs. H. L. White and P. Heinbecker, St. Louis.—p. 566.
Influence of Thyroid Gland on Absorption in Digestive Tract. T. L. Althausen and M. Stockholm, San Francisco.—p. 577.
Effects in Man and Dogs of Massive Doses of Insulin on Composition of Blood Serum. A. Keys, Minneapolis.—p. 608.
Influence of Vascular Factors on Mean Pressure, Pulse Pressure and Phasic Peripheral Flow. C. J. Wiggers, Cleveland.—p. 644.
Study of Circulatory Failure of Adrenal Insufficiency and Analogous Shocklike Conditions. W. W. Swingle, W. M. Parkins, A. R. Taylor and H. W. Hays, Princeton, N. J.—p. 659.
Effect of Adrenal Cortical Hormone on Circulatory Collapse of Adrenalin Shock. W. M. Parkins, W. W. Swingle, A. R. Taylor and H. W. Hays, Princeton, N. J.—p. 668.
Vitamin A Reserve of Fur Bearing Animals. A. D. Holmes, F. Tripp and G. H. Satterfield, Raleigh, N. C.—p. 693.
*Normal Antithrombin of Blood and Its Relation to Heparin. A. J. Quick, Milwaukee.—p. 712.
Renal Clearances of Iopax, Neo-Iopax and Shiodan in Man. W. W. Smith and H. A. Ranges, New York.—p. 720.
Effect of Bilateral Ligation of Lumbo-Adrenal Veins on Course of Pancreas Diabetes. H. E. Himwich, J. F. Fazekas and S. J. Martin, Albany, N. Y.—p. 725.
Experiment in Human Dietary Night-Blindness. G. Wald, H. Jeghers, Boston, and J. Arminio.—p. 732.

Antithrombin of Blood and Heparin.—Quick presents evidence which strongly supports the idea that the antithrombic action of the blood is due mainly to serum albumin. By means of simple but essentially quantitative methods it has been possible to demonstrate that a solution of serum albumin exhibits an antithrombic action remarkably similar to serum itself. It seems fairly certain that serum albumin is not a single substance and therefore it is probably more correct to say that perhaps a constituent of the albumin fraction is responsible for the antithrombic action.

Annals of Otol., Rhinol. and Laryngology, St. Louis

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The Problem of Intranasal Medication. T. E. Walsh and P. R. Cannon, Chicago.—p. 579.
Explanation of Respiratory Failure Sometimes Occurring After a Successful Tracheotomy. V. E. Negus, London, England.—p. 608.
Psychiatric Therapy in Dysphonia and Dysphonia: Stuttering, Psychophonasthenia, Aphonia, Falsetto. J. S. Greene, New York.—p. 615.
Tracheal Stenosis from Roentgen Therapy. L. H. Clerf and F. J. Putney, Philadelphia.—p. 666.
Underlying Factors Concerned in Otitic Hydrocephalus. H. L. Williams, Rochester, Minn.—p. 670.
Limitations of Bronchoscopy in Treatment of Tracheobronchial Tuberculosis. M. C. Myerson, New York.—p. 722.
Osteoma of Maxillary Sinus. A. G. Rawlins, San Francisco.—p. 735.
*Hiatal Hernia. H. J. Moersch, Rochester, Minn.—p. 754.
Diagnosis and Treatment of Ménière's Disease. S. H. Mygind and Dida Dederding, Copenhagen, Denmark.—p. 768.
Sinus Thrombosis: Part IV. Venous Thrombosis: Thrombosis of Superior Cerebral Vein. C. W. Irish, Los Angeles.—p. 775.
Spontaneous Cerebrospinal Rhinorrhea. S. A. Friedberg, Chicago, and T. C. Galloway, Evanston, Ill.—p. 792.
Consideration of Some of the Causative Factors of Vegetal Bronchitis. F. T. Hill, Waterville, Maine.—p. 814.
Treatment of Tuberculous Tracheobronchitis. F. W. Davison, Danville, Pa.—p. 826.

Hiatal Hernia.—Esophageal hiatal diaphragmatic hernias have been divided by Åkerlund into three types: (1) congenital short esophagus with partial or complete thoracic stomach, (2) esophageal hiatal hernia without short esophagus and in which the esophagus does not form a part of the hernia; that is, para-esophageal hernia, and (3) esophageal hiatal hernia in which the esophagus is shortened but in which the distal portion of the esophagus is a part of the hernial contents. Moersch bases the present study on 267 cases of diaphragmatic hernia encountered at the Mayo Clinic from 1932 to 1937, 246 of which were of the hiatal type, in contrast to fifteen traumatic and six congenital diaphragmatic hernias other than the hiatal type. Of these, 133 were in women and 113 in men. The average age of the patients was 55 years; the youngest patient was 8 years of age and the oldest 82. All but nineteen of the patients had clinical symptoms that could be directly attributable to the hernia. It was impossible, from the clinical

history alone, to distinguish between the three types of hiatal hernia. The esophagoscopic observations in cases of congenital short esophagus with intrathoracic stomach are a short esophagus with narrowing of the esophagogastric junction and the presence of a dilated portion below this point lined with gastric mucosa, with no evidence of the normal diaphragmatic hiatus. The sliding type of esophageal hiatal hernia may resemble closely the congenital short esophagus with intrathoracic stomach. The esophagus in the sliding type, however, is usually more redundant and the point of narrowing of the esophagogastric junction is less pronounced and shorter. Erosion and ulceration may occur in these cases as well as in cases of congenital short esophagus and may lead to difficulty in differential diagnosis. Bleeding is a frequent accompaniment of esophageal hiatal hernia. When this is present, esophagoscopy is advisable in determining whether or not ulceration and erosion are present. Carcinoma at the cardia at times may offer a great deal of difficulty in diagnosis roentgenographically, and this is especially true when associated with esophageal hiatal hernia. The possibility of a foreign body becoming lodged at the point of obstruction and obscuring the true underlying condition must be considered. The problem of treatment in cases of esophageal hiatal hernia is dependent on the type of hernia and the severity of symptoms. Treatment is not indicated in cases in which there is an absence of symptoms or in which the symptoms are of mild character. When the condition is due to a congenitally short esophagus with intrathoracic stomach dilatation of the narrowing at the esophagogastric junction usually will be sufficient. If definite stenosis is not present at the esophagogastric junction and, especially, if there is an absence of ulceration, the condition may not be a true short esophagus, although the roentgenologic and esophagoscopic observations would seem definite. In cases of other types of hernia, if the symptoms are severe, surgical repair is the procedure of choice. The postoperative results of repair of esophageal hiatal hernia are, as a rule, gratifying. Sixty-four of the 246 patients were subjected to operation.

Archives of Ophthalmology, Chicago

20: 359-540 (Sept.) 1938

Intra-Ocular Tension in Cases of Sarcoma of Choroid and Ciliary Body. J. H. Dunnington, New York.—p. 359.
*Clinical Significance of Retinal Changes in Leukemia. G. G. Gibson, Philadelphia.—p. 364.
Bilateral Congenital Ectopia Lentis with Arachnodactyly (Marfan's Syndrome). J. Laval, New York.—p. 371.
Nature and Management of Heterophorias. J. T. Maxwell, Omaha.—p. 375.
Optochiasmic Arachnoiditis: Importance of Mixed Type of Atrophy of Optic Nerve as Diagnostic Sign. D. Vail, Cincinnati.—p. 384.
Research Studies of the Eye: Some Technical and Practical Notes. A. Busacca, São Paulo, Brazil.—p. 395.
Advantages of Use of Coagulants in Ocular Operations, Especially in Extraction of Cataract and in Plastic Operations. A. Busacca, São Paulo, Brazil.—p. 406.
Rotation of the Cheek in Ophthalmology. J. F. S. Esser, Monaco.—p. 410.
Biochemistry of the Lens: XII. Studies on Glutathione in Crystalline Lens. L. Rosner, C. J. Farmer and J. Bellows, Chicago.—p. 417.
Retinitis Proliferans: Clinical and Histologic Studies. Bertha A. Klien, Chicago.—p. 427.
Studies of Visual Fields in Cases of Verified Tumor of the Brain. D. Kravitz, Brooklyn.—p. 437.
Binocular Vision and Orthoptic Procedure. Dorothy J. Shaad, New York.—p. 477.

Retinal Changes in Leukemia.—Gibson presents the results of a study of the retinal changes and the laboratory observations in twenty-two cases of leukemia. The ophthalmologic diagnosis and prognosis of leukemia are discussed and attention is directed to the close parallelism between the amount of hemorrhage in the retina and the degree of anemia which is associated with the leukemia. Confirmation of the parallelism was furnished by examination of three patients who on first observation had no retinal hemorrhages and only a mild degree of anemia. Subsequently, retinal hemorrhages developed and this development was associated with an appreciable decrease in the number of red blood cells. This decrease was out of proportion to the degree of the clinical hemorrhagic phenomenon. It seemed to make no difference whether the leukemia was of the myelogenous or of the lymphatic type. There is a similar but less consistent correlation between the hemoglobin and the retinal hemorrhages. It seems that therapeutic and investigative procedures could be more advantageously directed toward the factor of anemia instead of toward the leukocytosis in the unsolved problem of leukemia.

Archives of Otolaryngology, Chicago

28: 313-496 (Sept.) 1938

Evolution of Speech Organs of Man. V. E. Negus, London, England.—p. 313.
Diseases of Ventricle of Morgagni, with Special Reference to Pyocele of Congenital Air Sac of Ventricle. A. O. Freedman, Montreal.—p. 329.
Cancer of Laryngopharynx. H. B. Orton, Newark, N. J.—p. 344.
*Pathologic Differentiation Between Radiosensitive and Nonradiosensitive Malignant Neoplasms of the Larynx. W. Harris and P. Klemperer, New York.—p. 355.
Hemolytic Streptococcus Meningitis of Otitic Origin: Report of Recovery. P. Sachs, New York.—p. 364.
Spontaneous Hemorrhage into Maxillary Sinus. Sobisca S. Hall and H. V. Thomas, Clarksburg, W. Va.—p. 371.
Lympho-Epithelioma (Schminche Tumor). W. M. Fitzhugh Jr., San Francisco.—p. 376.
Influenza with Simultaneous Bilateral Spontaneous Pneumothorax and Subcutaneous Emphysema: Report of Case, with Comment on Mechanism of Production. A. H. Neffson and J. G. M. Bullowa, New York.—p. 388.
Congenital Dermoid Cyst and Fistula of Dorsum of Nose: Report of Case. E. W. Hagens, Chicago.—p. 399.
Bilateral Acoustic Neurofibromas. W. M. Craig and E. J. Steenrod, Rochester, Minn.—p. 404.
Paralysis of Inferior Oblique Muscle Following Caldwell-Luc Operation. J. N. Novich, Washington, D. C.—p. 412.
Paranasal Sinuses. S. Salinger, Chicago.—p. 418.

Radiosensitive and Nonradiosensitive Neoplasms.—Harris and Klemperer observed thirty-two successive cases of laryngeal carcinoma in which the only treatment was roentgen irradiation (Coutard). In the same period they studied two sarcomas of the larynx and one cylindroma, which also were treated by roentgen rays. All of the lesions occurred on the epiglottis or within the larynx. Twenty of the thirty-two patients responded favorably to the roentgen therapy. Twelve failed to respond. The biopsy material was studied histologically to determine criteria for a pathologic differentiation of radiosensitive and radioresistant neoplasms. The grade of cellular differentiations, mitotic count, anaplasia of the cells, reaction in the stroma and location of the neoplasms were carefully considered. Observations tend to show that there are no pathologic criteria, except possibly for the number of mitoses, which permit of a differentiation between radiosensitive and radioresistant laryngeal carcinomas if protracted fractional roentgen therapy is used. This conclusion seems to contradict the accepted belief that radiosensitivity depends to a great extent on the degree of differentiation of the tumor cells.

Archives of Physical Therapy, Chicago

19: 529-592 (Sept.) 1938

Psychologic Aspects of Physical Therapy. W. C. Menninger and B. L. Shiffler, Topeka, Kan.—p. 533.
Evaluation of Treatment of Peripheral Vascular Disease by Alternating Positive and Negative Pressure. E. P. Sturr, Philadelphia.—p. 539.
Physical Therapy in Internal Medicine: Comments on Its Merits and on Extension of Its Use. P. Irving, New York.—p. 543.
Ionization of Allergic Rhinitis. E. D. King, Cincinnati.—p. 546.
Postural Education. J. E. Malcomson, Detroit.—p. 548.
Common Causes of Failure from Colonic Therapy. J. W. Wiltsie, Binghamton, N. Y.—p. 554.
Clinical Examination of Labyrinthine Reflex by Galvanic Falling Reaction. E. J. Blonder, Chicago.—p. 561.
Fulguration of Contact Ulcers of the Vocal Cords. R. E. Hovard, Cincinnati.—p. 564.
Biologic Action of X-Rays and Radiosensitivity. H. Bordier, Lyon, France.—p. 567.

Delaware State Medical Journal, Wilmington

10: 189-204 (Sept.) 1938

Causes and Treatment of Uterine Bleeding. B. M. Anspach, Philadelphia.—p. 189.
*Calcium Therapy in Puerperal Infections. W. J. Cusick, Washington, D. C.—p. 194.
Combined Oral and Rectal Administration of Paraldehyde During Labor. H. F. Kane, G. B. Roth and T. E. Mandy, Washington, D. C.—p. 197.

Calcium Therapy in Puerperal Infections.—Cusick treated twenty-six patients with puerperal infections without a demonstrable cause outside of the pelvis in whom the temperature persisted above 101 F. for more than forty-eight

hours. The chief complaint was abdominal pain and tenderness, located in the lower part of the abdomen. Other complaints were frequency and urgency of urination. In fourteen cases the vaginal discharge was putrid. Microscopic examination of the discharge from both the cervix and the urethra was positive for gonococci in two cases and negative in twenty-four. The treatment employed included rest in bed, an ice bag to the lower part of the abdomen, elevation of the head of the bed, fluids in quantity, magnesia magma when necessary and no sedatives, douches or powerful cathartics. One ampule of 10 cc. of the 10 per cent product of the double salt of calcium gluconate and calcium galactogluconate was injected intragluteally and intravenously each day, after the needle of a 20 cc. syringe was inserted into a vein and 10 cc. of blood was withdrawn and permitted to mix with the calcium solution. Calcium gluconate, one heaping teaspoonful three times a day before meals, was given in warm milk. With this treatment the average hospitalization period was fourteen days, varying from a minimum of nine to a maximum of twenty-two days. The pain disappeared in nineteen patients within thirty-four hours, in four in forty-eight hours and in three within seventy-two hours. Rigidity of the abdomen disappeared in fifty-two hours and tenderness on pressure disappeared within six days. The temperature curve returned to normal within an average of six days. At the time of dismissal the pelves of all patients were examined and if there was any evidence of an inflammatory process, calcium gluconate was continued orally three times a day.

Georgia Medical Association Journal, Atlanta

27: 337-378 (Sept.) 1938

Acute Diverticulitis of Colon with Complications: Report of Cases. L. Grove and K. R. Bell, Atlanta.—p. 337.
Altered Mechanics of Supports of the Female Perineum. B. T. Beasley, Atlanta.—p. 344.
Problem Behavior in Children Is Symptomatic. W. W. Young, Atlanta. —p. 348.
Solution of Zinc Insulin Crystals versus Regular Insulin and Protamine Zinc Insulin. H. Bowcock and C. Wilkinson, Atlanta.—p. 351.

Illinois Medical Journal, Chicago

74: 197-288 (Sept.) 1938

Relation of Allergy to Diseases of Respiratory Tract. T. Nelson, Chicago.—p. 225.
Bronchoscopy in Relation to Diseases of Respiratory Tract. P. H. Holinger, Chicago.—p. 226.
Surgical Treatment of Pulmonary Tuberculosis. W. Van Hazel, Chicago. —p. 232.
Bronchiectasis. D. O. N. Lindberg, Decatur.—p. 235.
Pneumonia in Infancy and Childhood. J. B. Gillespie, Urbana.—p. 239.
Differential Diagnosis of Pulmonary Lesions from Roentgen Standpoint. A. Hartung, Chicago.—p. 243.
*Intradermic Immunization Against Scarlet Fever. C. A. Earle, Des Plaines.—p. 248.
Medical Treatment of Patients with Jaundice. S. A. Portis, Chicago.— p. 249.
Cancer and Precancerous Condition of the Skin. E. A. Oliver, Chicago. —p. 254.
If War Should Come. B. A. Brackenbury, Chicago.—p. 259.
The Field of Activity for the Woman's Auxiliary. I. Abell, Louisville, Ky.—p. 262.
The Management of Carcinoma Patients by the General Practitioner. C. O. Heimdal, Aurora.—p. 265.
Significance in Group Hospitalization Plan. T. J. Lamping, Chicago.— p. 269.
Pregnancy with One Kidney. W. G. Cummings, Winnetka.—p. 274.
Some General Aspects of Modern Therapy in Mental Disorders. P. M. Nation, Anna.—p. 276.
Instance of Hypertension Apparently Due to the Taking of Creosote for a Period of Nine Years. S. K. Robinson, Chicago.—p. 278.
Psychic Impotence. E. W. Hirsch, Chicago.—p. 279.
Nonepidemic Parotitis: Complication of Insulin Shock Therapy. J. W. Klapman, Chicago.—p. 283.

Intradermic Immunization Against Scarlet Fever.—It has been shown that about one tenth of the amount of toxin prescribed by the Dicks, if given into the skin, promises to be as effective as the large amount given subcutaneously and that it is unattended by unpleasant local and general reactions. This smaller amount may be given in three, or perhaps two, divided doses. Since the resulting immunity is probably in proportion to the amount of toxin given, Earle tried increasing amounts: 1,600 skin test doses for the first dose, 4,000 for the second dose and from 8,000 to 10,000 for the third and last dose. He gives these injections on the outer side of the arm above the elbow. He has now given more than 500 intradermal injections in from 50 to 9,000 skin test doses without unpleasant local or general reactions except in the case of one girl whose temperature rose to 101 F. for a day. At one time he gave fifty-four children three doses, 800, 4,000 and 8,000 skin test doses for the respective doses. A retest showed 87 per cent to be negative. Another group of sixty-one children were given 1,600, 4,000 and 8,000 skin test doses with the same result. Sufficient time has not elapsed to say how long the immunity resulting from intradermal injections will last. In all probability it will last for years. It is possible that a person actively immunized against scarlet fever may be less susceptible to other streptococcic infections. This contention is supported by the laboratory study of hemolytic streptococci which shows that the toxins of many strains are neutralized by scarlatinal antitoxin and are so nearly related that they cannot be differentiated qualitatively by any known test.

Journal of Immunology, Baltimore

38: 155-244 (Sept.) 1938

*Studies on Mechanism of Action of Sulfanilamide: III. Effect of Sulfanilamide in Serum and Blood on Hemolytic Streptococci in Vitro. J. S. Lockwood, with technical assistance of Helen M. Lynch, Philadelphia.—p. 155.
Specific Protective Property of Serum from Rats Infected with Cysticercus Crassicollis. D. H. Campbell, Chicago.—p. 195.
Specific Absorbability of Protective Antibodies Against Cysticercus Crassicollis in Rats and Crassicollis Pisiformis in Rabbits from Infected and Artificially Immunized Animals. D. H. Campbell, Chicago.— p. 205.
Quantitative Studies of Complement Fixation Reaction with Syphilitic Serum and Tissue Extract: Technic of Practical Quantitative Test. A. Wadsworth, F. Maltaner and Elizabeth Maltaner, Albany, N. Y.— p. 217.
Studies in Scarlet Fever Immunity. H. Plummer, Toronto.—p. 235.

Mechanism of Action of Sulfanilamide.—Lockwood suggests that blood containing peptone and sulfanilamide may be bactericidal. When peptone is excluded by washing the inoculum in serum or saline, sulfanilamide in the concentration similar to those occurring in the serums of treated patients will completely inhibit multiplication of young streptococci in serum, and sterility will frequently result within twenty-four hours if the inoculum is less than 5,000 chains per cubic centimeter. Smears of the serum after sterilization has occurred suggest that lysis of the majority of the inoculated organisms has taken place. The population curve in any medium is a resultant of the combined activities of peptone and sulfanilamide, with these two reagents exercising opposing effects. Sulfanilamide appears to prevent the specialized metabolic activity required of invasive organisms. The evidence indicates that this effect may be achieved through prevention of the utilization of the protein substrate by the organisms.

Journal of Investigative Dermatology, Baltimore

1: 235-312 (Aug.) 1938

Effects of Hydrogen Ion Concentration, Fatty Acids and Vitamin C on Growth of Fungi. S. M. Peck and H. Rosenfeld, New York.—p. 237.
*Formalized Herpes Virus Therapy and Neutralizing Substance in Herpes Simplex. S. B. Frank, New York.—p. 267.
Laughlen Test for Syphilis: Description of Certain Modifications, and Clinical and Serologic Comparison with Kline Test and Four Complement Fixation Methods. C. E. Rein and Clarice E. Haney, New York.—p. 283.
The Capillaries of the Skin: Review. E. M. Landis, Philadelphia.— p. 295.

Herpes Virus Therapy in Herpes Simplex.—Frank treated fourteen patients suffering from recurrent herpes simplex with herpes virus inactivated by formaldehyde and studied quantitatively the antibody response (i. e., the neutralizing titer of the blood serum) to its intramuscular injection and to natural infection. Thirteen patients showed an increase in the interval between attacks and a decrease of severity of the individual attacks. However, none of these patients experienced a complete remission. The recurrences following therapy were abortive and were characterized by the appearance of one, two or three vesicles, which would dry in from twenty-four to forty-eight hours, the crusts being gone in from two to four days. There was no change in the neutralizing titer in the blood serums collected before, during, following and

between attacks. Samples of blood collected from four patients who received the herpes virus were tested and showed no change in the neutralizing titer in spite of the clinical improvement experienced by these patients. Three samples of blood from six individuals who never had herpes showed the presence of the neutralizing substance and three did not. In contrast to this, the serums collected from twenty-two patients who had had herpes all possessed the neutralizing property.

Journal of Nutrition, Philadelphia

16: 209-308 (Sept.) 1938

Riboflavin Content of Meats. W. J. Darby and P. L. Day, Little Rock, Ark.—p. 209.

Further Studies on Dietary Factors Associated with Nutritional Muscle Dystrophy. S. Morgulis, Violet M. Wilder and S. H. Eppstein, Omaha.—p. 219.

Effect of High Glucose and High Fructose Diet on Body Weight and on Fat, Glycogen and Nitrogen Content of Liver and Body of Albino Rat. G. Bachmann, J. Haldi, W. Wynn and C. Enzor, Emory University, Ga.—p. 229.

Comparative Effects of High Glucose and High Fructose Diet on Activity, Body Weight and Various Constituents of Liver and Body of Albino Rat Exercising at Will. J. Haldi, G. Bachmann, C. Enzor and W. Wynn, Emory University, Ga.—p. 239.

Egg-Replacement Value of Proteins of Cereal Breakfast Foods, with Consideration of Heat Injury. J. R. Murlin, E. S. Nasset and M. Elizabeth Marsh, Rochester, N. Y.—p. 249.

Multiple Nature of Deficiency of Blacktongue-Producing Diets as Shown by Studies on Rats. O. M. Helmer and P. J. Fouts, Indianapolis.—p. 271.

Effect of Riboflavin on Incidence of Curled Toe Paralysis in Chicks. E. L. R. Stokstad and P. D. V. Manning, Petaluma, Calif.—p. 279.

Fatty Livers in Vitamin B_6 Deficient Rats. Nellie Halliday, Rochester, N. Y.—p. 285.

Effect of Roughage on Calcium Balance in Rats. W. H. Adolph, C. H. Wang and A. H. Smith, New Haven, Conn.—p. 291.

Comparison of Ferrous and Ferric Iron in Nutrition of the Rat. E. J. Underwood, Madison, Wis.—p. 299.

Journal of Pediatrics, St. Louis

12: 303-454 (Sept.) 1938

Recognition of Coarctation of Aorta (Adult Type) During Childhood. G. Eisenberg, Chicago.—p. 303.

Relation Between Plasma Ascorbic Acid Concentration and Diet in the Newborn Infant. R. L. Mindlin, Boston.—p. 309.

Vitamin C Content of the Blood in Newborn Infants. A. W. Fleming and H. N. Sanford, Chicago.—p. 314.

Incidence of Hemolytic Streptococci in Tonsils of Children as Related to Vitamin C Content of Tonsils and Blood. A. D. Kaiser and Betty Slavin, Rochester, N. Y.—p. 322.

Vitamin C in Tuberculosis: Effect of Supplementary Synthetic Vitamin C on Urinary Output of This Vitamin by Tuberculous Children. T. S. Bumbalo and W. W. Jetter, Buffalo.—p. 334.

Evaluation of Serologic Tests for Congenital Syphilis, with Special Reference to Neonatal Period. J. A. V. Davies, Boston.—p. 341.

*Diphtheritic Polyneuritis: Report of Nine Cases. J. M. Arena and L. P. Rasmussen, Durham, N. C.—p. 352.

*Treatment of Meningococcic Meningitis: Intraspinal Use of Antimeningococcus Serum at Bellevue Hospital, 1928 to 1936. N. W. Bolduan, Forest Hills, N. Y.—p. 357.

Gaucher's Disease in Early Infancy: Review of Literature and Report of Case with Neurologic Symptoms. A. J. Abulli and K. Kato, Chicago.—p. 364.

Treatment of Gonorrheal Vaginitis with Corbus-Ferry Gonococcus Filtrate. L. E. Goldberg, Newark, N. J., and K. Blanchard, East Orange, N. J.—p. 381.

Celiac Disease and Its Ultimate Prognosis. S. V. Haas, New York.—p. 390.

Diphtheritic Polyneuritis.—During 1937 twenty-five children with diphtheria were admitted to Duke Hospital, nine of whom had polyneuritis due to their infection. The patients were all seen late, and local as well as generalized paralysis had developed. Six of the nine children on whose condition Arena and Rasmussen report had such mild attacks of diphtheria that they were not recognized as such and therefore not treated. The three treated children received only 10,000 units of diphtheria antitoxin late in the course of the disease, one as late as the sixteenth day. Of the nine children, three were referred to the hospital with a diagnosis of acute anterior poliomyelitis, two as having a brain abscess and one with Bell's palsy; the remaining three were diagnosed correctly. Two of the nine children died with myocardial failure. Seven recovered in from one to four months.

Intraspinal Serum in Meningococcic Meningitis.—Bolduan records the results of the intraspinal use of antimeningococcus serum in 191 patients from infancy to 12 years of age, seen from 1928 through 1936 at Bellevue Hospital. During the years 1928 to 1932 the majority of the patients received serum intraspinally once every twenty-four hours, while from 1932 to 1936 serum was given intraspinally every twelve hours until definite improvement ensued. The criteria for discontinuing serum therapy were decrease of spinal fluid pleocytosis to about 500 cells or less, normal or rapidly falling blood leukocytosis, rising spinal fluid sugar and persistent negative spinal fluid culture. If the foregoing criteria had not been attained after four or five days, a change in the type of serum was made, often with a beneficial outcome. There were forty-eight deaths. This includes one patient who died of a secondary streptococcic meningitis and eighteen patients who received either no treatment (postmortem diagnosis) or who died within twelve hours of the initiation of therapy. Complications developed in from 35 to 40 per cent of the patients (arthritis, otitis media, mastoiditis, nerve deafness, ophthalmitis and blindness). In 1928 and 1929 about 155 cc. of serum was used per patient and in 1935 and 1936 this average was 165 cc. Of forty-eight patients who between 1928 and 1936 received serum by the intravenous as well as by the intraspinal route (usually from 20 to 30 cc. intravenously) ten died. Of those who did not receive serum intravenously there were thirty-eight deaths among 143 patients. The case fatality for 1935 and 1936 of forty-six patients with but three deaths (7 per cent), compared to twenty-two deaths (23 per cent) of ninety-four patients, is ample confirmation of the author's faith in the orthodox method of therapy. During 1928 and 1929, of eighty patients who survived one week, sixty-eight stayed in the hospital longer than two weeks. In 1935 and 1936, of forty-three patients who survived one week, only twenty-five stayed longer than two weeks. In seeking a cause for the reduction in the case fatality rate and in the period of hospitalization from 1928 through 1936 it was felt at first that the administration of serum at intervals of twelve hours was largely responsible. However, two other possibilities had to be considered; a change in the virulence of the organism and an increase in the potency of the serum used. However from figures obtained from the New York City health department the organisms responsible for the 1935-1936 outbreak were quite as virulent as those in 1928 and 1929. Therefore a part of the reduction in case fatality must be ascribed to an increase in the potency of the serums used. Nevertheless, the interval between doses contributed in part to the reduction of mortality.

Journal of Pharmacology & Exper. Therap., Baltimore

63: 353-478 (Aug.) 1938

*Sulfanilamides in Tertian Malaria. W. E. B. Hall, St. Joseph, Mo.—p. 353.

Toxicity of Some Organic Selenium Compounds. A. L. Moxon, H. D. Anderson and E. P. Painter, Brookings, S. D.—p. 357.

Pharmacology of Some New Local Anesthetics. A. R. McIntyre and R. F. Sievers, Omaha.—p. 369.

Effect on Intestinal Motility of Cyclopropane Anesthesia Alone and After Morphine-Scopolamine Premedication. W. Weisel, W. B. Youmans and W. H. Cassels, Madison, Wis.—p. 391.

Further Studies on Mechanism of Peptone Shock. C. A. Dragstedt, F. B. Mead and S. W. Eyer, Chicago.—p. 408.

Effect of Para-Aminobenzenesulfonamide on Oxygen Consumption of Tissue and Certain Pathogenic Bacteria. H. I. Chu and A. B. Hastings, Boston.—p. 407.

Effect of Morphine on Skin and Rectal Temperatures of Dogs as Related to Thermal Polypnea. A. Hemingway, New Haven, Conn.—p. 414.

Antianesthetic Effects of Some Convulsants in the Albino Mouse. A. M. Hjort, E. J. De Beer and D. W. Fassett, Tuckahoe, N. Y.—p. 421.

Some Tetrahydroisoquinolines: III. Relative Antianesthetic Effects. A. M. Hjort, E. J. De Beer and D. W. Fassett, Tuckahoe, N. Y.—p. 432.

Bulbocapnine-Benzedrine Antagonism. E. Spiegel, Philadelphia.—p. 438.

Further Studies on Absorption of Mercurial Diuretics as Influenced by Theophylline and Other Substances. R. A. Lehman and A. Dutcher, New York.—p. 443.

Trichlorethanol, Tribromethanol, Chloral Hydrate and Bromal Hydrate. G. Lehmann and F. K. Knoefel, Louisville, Ky.—p. 453.

Sulfanilamides in Tertian Malaria.—Hall used sulfanilamides in four consecutive cases of tertian malaria after chills had been well developed in the course of dementia paralytica therapy. Prontosil (prontosil soluble) and sulfanilamide were given separately and in combination while in vitro cultures were made. Chills, with characteristic malarial blood cycles,

continuing in patients receiving sulfanilamide compounds over periods of fifty, seventy, seventy-three and more than 112 hours, indicated that the agents have no effect on tertian malaria within these intervals, nor does further administration to the point of possible effect on the parasite appear advisable. When one considers that prompt response is the primary governing factor in the choice of therapeutic agents, quinine supplemented by atabrine or plasmochin in indicated resistant cases remains as a quickly acting and satisfactory drug in the treatment of malaria. The sulfanilamides do not have a place in tertian malaria, according to the experiments, except as conjectured agents in persistently resistant forms of malaria.

Medical Annals of District of Columbia, Washington

7: 269-306 (Sept.) 1938

Criteria for Early Diagnosis of Cancer of Stomach with Critical Analysis of Value of Flexible-Tube Gastroscopy. F. A. J. Geier, Washington.—p. 269.
A Program for the Prevention of the Common Communicable Diseases. P. W. Gard, Washington.—p. 279.
Saddle Thrombus at Bifurcation of Aorta: Report of Case Treated Conservatively. W. R. Morris, Washington.—p. 285.
Raynaud's Disease. E. J. C. Hildenbrand, Washington.—p. 287.
Hopeful Trends in the Management of Deafness. V. R. Alfaro, Washington.—p. 289.

Minnesota Medicine, St. Paul

21: 601-670 (Sept.) 1938

Phases of Bronchoscopy and Esophagoscopy of Importance in General Practice. V. J. Schwartz, Minneapolis.—p. 601.
Use of Pedicle Muscle Grafts in Facilitating Obliteration of Large, Chronic, Nontuberculous, Pleural Empyema Cavities. H. K. Gray, Rochester.—p. 608.
Acute Upper Respiratory Infections with Gastrointestinal Symptoms. E. D. Anderson, Minneapolis.—p. 611.
Solitary Diverticulitis of the Cecum. W. N. Graves, Duluth.—p. 615.
Fundamentals in Surgical Treatment of Colon Disorders. L. M. Larson, Minneapolis.—p. 617.
Practical Physiology of the Nose. H. I. Lillie, Rochester.—p. 621.
Syncope. B. T. Horton, L. M. Eaton and L. S. Meriwether, Rochester.—p. 628.
*Exfoliative Dermatitis as a Manifestation of Monocytic Leukemia (Schilling). H. Montgomery and C. H. Watkins, Rochester.—p. 636.
Artificial Impregnation. R. T. Seashore, Duluth.—p. 641.
Modern Treatment of Burns: Evaluation of Various Methods Used in 968 Cases in the Cook County Hospital. K. A. Meyer and J. L. Wilkey, Chicago.—p. 644.

Exfoliative Dermatitis in Monocytic Leukemia.—In the last six months of 1937, Montgomery and Watkins encountered four additional cases (two were reported previously) of monocytic leukemia of Schilling associated with exfoliative dermatitis. In these latter cases, changes in the blood may have preceded changes in the skin. It is becoming increasingly apparent that cutaneous manifestations, and especially exfoliative dermatitis, are frequent in monocytic leukemia; about 50 per cent of the cases reported by others have been associated with specific or nonspecific cutaneous lesions. This is in contrast to the relative rarity of specific cutaneous lesions associated with myelogenous leukemia. Purpuric, hemorrhagic and bullous lesions are frequently encountered early in the course of monocytic leukemia, in contrast to their usual appearance as a terminal manifestation in cases of other forms of lymphoblastoma. They may result from specific infiltrations of the skin. Ulcerative gingivitis and bleeding of the gums, which appear to be frequent manifestations of monocytic leukemia, were not associated with exfoliative dermatitis in the authors' six cases. The development of ulcers and furuncle-like lesions is usually a late or terminal manifestation of the disorder. The histopathologic picture of exfoliative dermatitis remains that of the original benign dermatosis or lymphoblastoma causing the exfoliative dermatitis, although it may not be specific as to the type of lymphoblastomatous involvement. The treatment of monocytic leukemia of Schilling is only palliative and consists of high voltage roentgen therapy or radium therapy if the condition is not too acute. Moderate rather than intensive dosage usually gives the best results. The cutaneous lesions frequently involute temporarily, after superficial local roentgen therapy, or indirectly as the result of systemic high voltage roentgen therapy. In acute leukemia treatment is of no avail.

New Orleans Medical and Surgical Journal

91: 111-162 (Sept.) 1938

Relationship of Dentistry to Medicine. H. A. Gaudin, New Orleans.—p. 111.
History of Ophthalmology and Otolaryngology in America, with Special Reference to Louisiana and Mississippi. C. A. McWilliams, Gulfport, Miss.—p. 112.
Acute and Chronic Bacillary Dysentery: Their Relationship to Many Obscure Forms of Colitis and Enteritis. J. Felsen, New York.—p. 114.
Recent Progress in Diagnosis and Treatment of Gastric and Duodenal Ulcer. A. L. Levin and M. Shushan, New Orleans.—p. 120.
Use of Camphor in Oil to Check Lactation. E. C. Smith, New Orleans.—p. 127.
Some Observations on Use of Urinary Antiseptics. J. G. Pratt, New Orleans.—p. 130.
Observations on Insulin and Metrazol Therapy at Central Louisiana State Hospital. S. J. Phillips, Pineville, La.—p. 135.

New York State Journal of Medicine, New York

38: 1151-1204 (Sept. 1) 1938

The History of Public Health. J. R. Earp, Albany.—p. 1151.
Cirrhosis Arrested in a Diabetic Following Insulin Therapy: Report of Case. J. F. Hart and J. R. Lisa, New York.—p. 1158.
Bromsulphalein Test: Checked with Liver Histology. L. Bauman and Louise Orr, New York.—p. 1161.
Primary Papillary Carcinoma of Ureter: Nephro-Ureterectomy. M. E. Greenberger and A. J. Greenberger, New York.—p. 1162.
Controllable Elements in Infant Mortality. F. A. Kassebohm and M. J. Schreiber, New York.—p. 1165.
Tardy Diagnosis of Tumors Affecting the Spinal Cord. W. P. VanWagenen and J. Rossier, Rochester.—p. 1169.
Rheumatic Fever: Relationship of Preceding Infection, Tonsillectomy and Mode of Onset. B. H. Archer, New York.—p. 1177.
Fascial Plastic Operation for Repair of Old Rupture of Rectus Femoris Muscle. M. S. Burman, New York.—p. 1183.
Mucocele of Appendix: Simulating a Neoplasm of the Cecum. I. Kross, New York.—p. 1185.
Pick's Syndrome. H. L. Frosch, New York.—p. 1186.

38: 1205-1256 (Sept. 15) 1938

Mortality of Acute Appendicitis: Analysis of 186 Surgical and Sixty-Nine Nonsurgical Deaths. U. Maes and Elizabeth M. McFetridge, New Orleans.—p. 1205.
Bronchopleural Cutaneous Fistula: Report of Two Cases Treated with Pedicle Flap from Latissimus Dorsi Muscle. I. E. Siris, Brooklyn.—p. 1213.
*Rheumatoid Arthritis: Treatment with Sting of Honeybee. Edith E. Nicholls, New York.—p. 1218.
Arthritis: Relationship of Dental Infection. S. Selig, New York.—p. 1221.
Diphtheria: Susceptibility in a Well Immunized Community. C. H. Maxwell, B. L. Cullen and R. J. Thomas, Auburn.—p. 1227.
Zigzag Method in Insulin Therapy of Schizophrenia. Ruth M. Wilmanns and M. Hayman, Sykesville, Md.—p. 1232.
Unusual Case of Rhinophyma. J. D. Whitham, New York.—p. 1233.
Agranulocytosis: Following Administration of Arsphenamines and Bismuth: Report of Case. A. T. Mays, Brooklyn.—p. 1234.

Rheumatoid Arthritis.—Nicholls treated twenty-seven patients with active rheumatoid arthritis with bee stings. The patients had previously received various forms of treatment without beneficial results. Forms of treatment supplementary to the stings of the honeybee were limited to a minimum. An unrestricted diet high in vitamins was usually recommended. Acetylsalicylic acid was frequently prescribed for the relief of pain, and patients were advised to apply heat to the affected joints. All stings were administered by the beekeeper. The site selected depended on the location of the most painful joints. The initial dose was one bee sting. If no reaction followed, the number was increased to three stings at the next visit. The treatment was continued at weekly intervals, the number of stings being increased at each visit. If itching of the skin or any general reaction developed the number of stings was decreased or the treatments were discontinued. Five patients had to discontinue treatments after a few weeks because of severe local or general reactions. Two stopped because they found the treatments disagreeable. Twenty patients continued with the treatment for from three to eighteen months and received from fifty-three to 1,434 stings. Three of the patients were markedly improved and remain well one year later; five were slightly improved; five remained the same, and seven became much worse. Eleven patients experienced severe itching for a few weeks, a generalized maculopapular rash

developed in four, an increase in the joint pains occurred the day following the stings in seven and four experienced severe headache.

Northwest Medicine, Seattle

37: 271-306 (Sept.) 1938

Cancer of Cervix. R. E. Watkins, Portland, Ore.—p. 274.
Appendectomy in General Practice. W. F. Howard, Pocatello, Idaho.—p. 278.
Hyperplastic Tuberculosis of Cecum and Appendix: Report of Case. C. E. Littlehales, Aberdeen, Wash.—p. 280.
White Blood Count and Sedimentation Rate in Various Stages of Appendicitis. M. S. Rosenblatt and R. H. Humphreys, Portland, Ore.—p. 283.
Gout. J. M. Bowers, Seattle.—p. 284.
Vitamin C and Chronic Arthritis. K. K. Sherwood, Seattle.—p. 288.
Cause of Syncope in Patients with Hypersensitive Carotid Sinus: Report of Case. L. Patricelli, Seattle.—p. 290.
Nausea and Vomiting of Pregnancy: Management. D. J. Thorp, Seattle.—p. 294.
Marked Eosinophilia: Case. H. B. Currin, Klamath Falls, Ore.—p. 296.
Less Common Manifestations of Allergy. J. E. Stroh, Seattle.—p. 297.
Plantar Wart: Case Report. W. Kelton, Seattle.—p. 299.

Ohio State Medical Journal, Columbus

34: 961-1084 (Sept.) 1938

Clinical Use of Sulfanilamide and Its Derivatives, with Special Reference to Their Possible Toxic Effects. P. H. Long, Baltimore.—p. 977.
The Hearing Problem: A Challenge to Medicine. C. E. Kinney, Cleveland.—p. 982.
Indications for Surgical Treatment of Cholecystitis and Cholelithiasis. C. H. Lenhart, Cleveland.—p. 987.
Early Diagnosis and Care of Pregnancy. H. E. McClenahan, Youngstown.—p. 991.
Hereditary Factors in Growth and Development. A. J. Bell, Cincinnati.—p. 996.
Postpartum Fever. W. K. Gregg, Dayton.—p. 1001.
Prevention and Treatment of Neurosyphilis. N. Michael, Columbus.—p. 1004.
Goiter Heart. J. L. DeCourcy, Cincinnati.—p. 1006.
Importance of Rectal Examination. R. I. Brashear, Columbus.—p. 1008.
Instructions to Mothers on Infant Care. J. W. Larcomb, Columbus.—p. 1009.
Acute Perforation of the Gallbladder. W. W. Stone and F. M. Douglass, Toledo.—p. 1012.

Oklahoma State Medical Assn. Journal, McAlester

31: 295-332 (Sept.) 1938

Mottled Enamel in Oklahoma Panhandle and Its Possible Relation to Child Development. J. A. Blue, Guymon.—p. 295.
*Recurrent Iritis in Undulant Fever with Concurrent Rheumatic and/or Arthritic Disease. J. R. Reed and E. Goldfain, Oklahoma City.—p. 302.
Undulant Fever: Correlation with Fatigue and Low Grade Fevers. Eleonora L. Schmidt and Elizabeth Dorsey, Norman.—p. 304.
Chronic Gonorrhea. J. H. Howe, Ponca City.—p. 306.
Acute Gonorrhea. R. H. Akin, Oklahoma City.—p. 309.
Necessity of Careful Eye Examinations. D. M. K. Thompson, Muskogee.—p. 312.

Recurrent Iritis in Undulant Fever.—Reed and Goldfain state that chronic brucellosis may be an etiologic factor in the causation of ocular disease, especially iritis. One should carry out tests for undulant fever properly and intelligently when the other more common causes of disorders of the eye have been searched for and not found. Five cases are reported with rather similar histories and changes in that each patient either is suffering from arthritis or has suffered from a rheumatic disease syndrome. Each patient also presented ocular symptoms (recurrent iritis), some of which have been serious. Strongly positive cutaneous reactions were present when tests with the undulant fever organism were made. In addition to strongly positive cutaneous reactions, they yielded a positive opsonic index for undulant fever, indicating active infection when considered in connection with the cutaneous test. Some of them also had positive agglutination tests. In accordance with the criteria of Huddleson, a diagnosis of positive chronic undulant fever infection was established because the opsonic index test revealed phagocytosis in mild, moderate or marked degree of less than 60 per cent and because of the presence of a positive cutaneous test in all five cases, plus a positive agglutination test in four of the cases. While the authors cannot state conclusively that the ocular symptoms were caused by the chronic undulant fever, they feel that it is quite probable in the presence of the unmistakable serologic and immunologic cutaneous reactions for brucellosis.

Pennsylvania Medical Journal, Harrisburg

41: 1083-1296 (Sept.) 1938

Jejunal Feedings Following Operations on Stomach and Duodenum in Malnourished Patient. J. B. Mason, Philadelphia.—p. 1083.
Management of the Common Cold. H. H. Perlman, Philadelphia.—p. 1086.
The Common Cold from the Standpoint of the Otolaryngologist. N. S. Weinberger, Sayre.—p. 1089.
Treatment of Fracture of the Shaft of the Femur, with Special Reference to Russell and Skeletal Traction. W. L. Estes Jr. and D. P. Waller, Bethlehem.—p. 1092.
Gout Among Arthritics. A. Cohen, Philadelphia.—p. 1100.
The Subconjunctival Cataract Operation. J. B. Feldman, Philadelphia.—p. 1104.
Antenatal and Intrapartum Care of the Fetus. T. L. Montgomery, Philadelphia.—p. 1108.
Management of the Newborn. E. L. Bauer, Philadelphia.—p. 1114.
Relief of Intractable Pain by Subarachnoid Injection of Alcohol. C. H. Harney and H. N. Kehres, Bryn Mawr.—p. 1117.
The Public Relations Policy of the Medical Profession. R. S. Reeves, Philadelphia.—p. 1123.
Treatment of Skin Malignancy by Irradiation. H. W. Jacox, Pittsburgh.—p. 1126.
Role of Renal Infections in Mechanical and Neurogenic Obstructive Uropathies. J. C. Birdsall, Philadelphia.—p. 1130.
Milk Allergy in Children. S. C. Copeland and J. P. Keating, Philadelphia.—p. 1133.
The March of Events in Pediatrics. T. O. Eiterich, Pittsburgh.—p. 1137.
Chronic Pemphigus: Dermatoneurologic Study. A. Strickler and A. Gordon, Philadelphia.—p. 1140.
Pyogenic Liver Abscess. E. L. Eliason, R. B. Brown and D. P. Anderson, Philadelphia.—p. 1147.
Pediatric Problems Related to Cerebrohydrodynamics. T. Fay, Philadelphia.—p. 1154.
Serum Phosphatase as an Aid in Diagnosis of Metastasis of Cancer to the Liver. D. R. Meranze, T. Meranze and M. M. Rothman, Philadelphia.—p. 1160.

Radiology, Syracuse, N. Y.

31: 261-390 (Sept.) 1938

Roentgen Visualization of Pulmonary Arterial Circulation in Autopsy Material. C. C. Birkelo and W. L. Broslus, Detroit.—p. 261.
Radiotherapy for Tumors of the Testis. E. T. Leddy and A. U. Desjardins, Rochester, Minn.—p. 293.
*Detection of Crystalline Silica in Lung Tissue by X-Ray Diffraction Analysis. H. C. Sweany, Rosalind Khass, Chicago, and G. L. Clark, Urbana, Ill.—p. 299.
Dosage Chart for X-Ray Therapy. Edith H. Quimby, New York.—p. 308.
Effect of Filtration on Divergent Beams at Supervoltages. Henrietta S. Hayden, K. E. Corrigan and B. Cassen, Detroit.—p. 312.
Attenuation and Transition Effects in Absorption of Supervoltage Radiation. B. Cassen, K. E. Corrigan and Henrietta S. Hayden, Detroit.—p. 319.
X-Rays and Biopsitome in Study of Corpus Uteri. B. H. Orndoff, Chicago.—p. 325.
Discussion of Generalized Osteosclerosis: Report of Unusual Case. P. C. Swenson and G. G. Holzman, New York.—p. 333.
Further Observations Concerning Recovery of Lost Radium. R. B. Taft, Charleston, S. C.—p. 340.
Anomalies of Clavicle, with a Previously Unreported Variation. C. Lichtman and N. B. Freedman, Montreal.—p. 345.
*X-Ray Studies on Effect of Opium on Gastrointestinal Tract in Man. E. H. Fell, Chicago.—p. 348.
Development of High Voltage X-Ray Tubes at the California Institute of Technology. C. C. Lauritsen, Pasadena, Calif.—p. 354.

Crystalline Silica in Lung Tissue.—Sweany and his collaborators subjected samples of lung tissue from a wide variety of cases to x-ray diffraction analysis. Previous to the chemical analysis the tissues had been hardened in a dilute solution of formaldehyde, dried in vacuo at 70 C., ground to pass a 40 mesh sieve and dried further to constant weight at from 105 to 110 C. For the x-ray study thin samples were prepared by packing the powdered tissue into disks from 0.2 to 0.3 mm. in thickness. The x-ray beam, collimated by two 0.01 inch pinholes, was supplied by a tube with a copper target, operating at peaks of 20 milliamperes and 27 kilovolts. The film was held in a flat holder at a distance of 5 cm. from the sample. The exposure time was usually seven hours. The results show that there is a close parallelism between the presence of silicotic fibrosis and the presence of quartz. In several of the cases investigated the pathologic changes were slight and at times doubtful; yet there was sufficient indication that the threshold of danger was approaching. In normal lungs and unexposed lungs the quartz lines were uniformly absent. In some cases the large amount of silica was probably chiefly due to silicates. Application of the technic is still in the

experimental stage. There would seem to be great possibilities for its use, but until further studies have been made caution should be exercised in expecting more than preliminary data would warrant. The method, although sharply specific, is thus far only qualitative. However, in all probability it can be developed on a quantitative or a semiquantitative basis. The authors' experiments have been confined chiefly to lung tissue, with a few analyses on lymph nodes. The determination, therefore, is applicable only to patients who have died. It seems highly probable that results of some value may be obtained from the study of sputum by this method. The method of determination of quartz in mine dust, as described by Clark and Reynolds, has vast possibilities in the evaluation of the hazards of working conditions. No dust analysis should be considered complete without an x-ray diffraction analysis to show when quartz is present, the amount and the size of the particles. The finding of quartz lines in the x-ray diffraction pattern of dried and ground lung tissue indicates the presence of sufficient quartz to produce or to have already produced silicotic fibrosis.

Effect of Opium on Gastrointestinal Tract.—Fell presents the results of repeated gastrointestinal x-ray examinations on three normal subjects conducted during protracted administration of opium. Control observations were carried out on the same subjects at times when they did not receive the drug. There was no characteristic delay in the emptying time of the stomach. An apparent slowing of the barium sulfate in the upper portion of the small intestine was revealed by an increased concentration of barium sulfate in that portion (a feathery appearance). There was no marked delay in the emptying time of the small intestine. An increased rate of motility in the large intestine occurred in only one subject. There was a delay in the emptying time of the ascending colon of from eight to thirty-one hours, and from four to twenty-six hours in the total emptying time of the intestine. Difficulty in expelling stools was experienced in spite of an increased desire to defecate. The action of the ileocecal valve was uninfluenced by opium. Opium caused constipation and small, dry and hard stools. This work suggests that opium produces constipation by causing difficulty in the expelling of the stools rather than direct action on the motility of the gastrointestinal tract. The difficult defecation depends perhaps on the hardness and dryness of the stools or on increased tone of the anal sphincters.

Southern Medical Journal, Birmingham, Ala.

31: 959-1042 (Sept.) 1938

Some Observations on Repair of Cleft Lip. N. Owens, New Orleans.—p. 959.
Unusual Secondary Changes in Myoma of Uterus. L. C. Harris Jr. and H. C. Schneisser, Memphis, Tenn.—p. 968.
Altered Mechanics of the Female Pelvic Structures. B. T. Beasley, Atlanta, Ga.—p. 976.
Treatment of Sterility. L. J. Glober, San Antonio, Texas.—p. 981.
Endometrioma of Umbilicus Following Cesarean Section. G. T. Tyler Jr., Greenville, S. C.—p. 987.
Glaucoma: Report of Case. C. D. Humberd, Barnard, Mo.—p. 988.
Renal and Perirenal Tumors in Children: Report of Two Cases. W. F. Lake and A. J. Ayers, Atlanta, Ga.—p. 992.
Modern Care of Anorectal Fistula. C. D. Gaston, Birmingham, Ala.—p. 996.
"Primary" Streptococcic Peritonitis Treated with Sulfanilamide: Report of Case with Recovery. J. S. Horsley Jr. and D. G. Chapman, Richmond, Va.—p. 999.
Results of Roentgen Therapy in Essential Hypertension. F. P. Boswell, Montgomery, Ala.—p. 1001.
Diagnosis of Nasal Allergy and Its Relation to Other Manifestations. P. K. Hansel, St. Louis.—p. 1003.
Syphilis, Malaria and Hookworm Disease as Industrial Hazards in the South. C. F. Holton, Savannah, Ga.—p. 1011.
Unrecognized Disorders Frequently Occurring Among Infants and Children from the Ill Effects of Milk. W. A. McGee, Richmond, Va.—p. 1016.
Ulcus Corneae Rodens (Mooren's Ulcer). J. F. Townsend, Charleston, S. C.—p. 1020.
Human Glanders: Case Report. A. A. Herold and C. B. Erickson, Shreveport, La.—p. 1022.
Research and Graduate Teaching in the Preclinical Departments of Southern Medical Schools. T. P. Nash Jr., Memphis, Tenn.—p. 1022.
Orthopedic Participation in a Public Program of Care for Crippled Children. A. F. Voshell, Baltimore.—p. 1029.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

22: 513-576 (Sept.) 1938

World-Wide Distribution of Trachoma, Excluding the Dominions, Colonies and Mandated Territories of Great Britain. A. F. MacCallan.—p. 513.
Withdrawal of Interretinal Fluid in Detachment Operation by Simple Suction Apparatus. C. J. Blumenthal.—p. 542.
*Hydrostatic Approach to Posterior Chamber for Diagnostic and Therapeutic Purposes. A. Motegi.—p. 543.

Hydrostatic Approach to Posterior Chamber.—Motegi used intra-ocular irrigation for the examination and treatment of patients with poor vision in whom the anterior segment of the eye is nearly normal but the fundus is invisible; patients with poor vision, following diseases of the anterior segment peculiar to the tropics, in whom the fundus is invisible, and patients with panophthalmitis. Through an incised wound of the eyeball 0.9 per cent saline solution or Ringer's solution at body temperature is run. The excess solution drops out of the wound. In infected cases this may be followed by autoserum. If the vitreous is fluid, the eye tends to collapse as it exudes. The irrigation restores the globular form of the eye and enables observation of the interior to be made through the incision. If the vitreous is turbid it is easier to see the fundus through the clear saline solution, which replaces it, than through the hazy medicum. This method permits removal of foreign bodies and lavage of infective material from the posterior chamber in cases of panophthalmitis with the possibility of cure under direct vision.

Journal of Pathology and Bacteriology, Edinburgh

47: 205-360 (Sept.) 1938

Production of Homogeneous Suspensions of Vaccinia Elementary Bodies and Histology of Associated Skin Lesions. C. R. Amies.—p. 205.
Structure of "Rough" and "Smooth" Colonies. K. A. Bisset.—p. 223.
Antigenic Basis of Tumor Transplantation. P. A. Gorer.—p. 231.
Diffuse Leptomeningeal Tumor in a Child: Comments on "Sarcomatosis" of Meninges. R. A. Willis.—p. 253.
*Haemophilus Para-Influenzae Endocarditis. A. A. Miles and J. Gray.—p. 257.
Estrogens of Testis and of Adrenal in Relation to Treatment of Enlarged Prostate with Testosterone Propionate. C. W. Emmens and A. S. Parkes.—p. 279.
Mesenteric Chylodenectasis with Steatorrhea and Features of Addison's Disease. L. E. Glynn and M. L. Rosenheim.—p. 285.
Histologic Types of Meningiomas and Comparison of Their Behavior in Tissue Culture with That of Certain Normal Human Tissues. J. O. W. Bland and Dorothy S. Russell.—p. 291.
Atypical Amyloidosis with Macroglossia. W. G. Barnard, F. B. Smith and J. L. Wardhaugh.—p. 311.
Reactivity of Some Diphtheria Prophylactics. P. J. Moloney and M. D. Orr.—p. 315.
Suprasellar Tumor in Dog. E. G. White.—p. 323.
Polycythemia Terminating in Leuko-Erythroblastic Anemia. Doris M. Stone and Dorothy Woodman.—p. 327.
*Sensitivity of Rheumatic Subjects to Streptococcus Products. C. A. Gross.—p. 337.

Haemophilus Para-Influenzae Endocarditis.—Miles and Gray describe two cases of infective endocarditis, apparently due to Haemophilus para-influenzae. Comparison of these with previously reported cases of "influenza" and para-influenza bacillus endocarditis reveals no significant difference in clinical characteristics, nor do the anatomic or histologic observations distinguish the hearts from others with subacute "influenzal" or streptococcic endocarditis. Ulceration, excessive formation of granulation tissue and marked infiltration of the polymorphonuclear cells are conspicuous histologic features in the two cases, but these are not distinctive. The septic nature of the lesion found in some parts conforms with the relatively rapid progress of the disease and, in view of the observed variable duration of "influenzal" endocarditis, the septic features do not necessarily indicate a characteristic tissue reaction to hemophilic bacilli. The features of the reported cases suggest respiratory lesions as the source of the endocardial infection. There is no record of infection of the endocardium with Haemophilus influenzae identified by tests in the X and the V medium. All strains of endocarditis to which such tests have been applied have proved to be Haemophilus para-influenzae. There are indications that some of the so-called influenza bacillus infections were due to Haemophilus para-influenzae.

A systematic description is given of the two strains of endocarditis isolated. They synthesize the X but not the V factor and are identified as Haemophilus para-influenzae, nonhemolytic variety. Their characteristics are compared with those of two other strains of endocarditis of Haemophilus parainfluenzae and of eighteen strains freshly isolated from human sources other than the endocardium and blood. The two strains are serologically related to each other, to one of the endocarditis strains and to two of the eighteen nonendocardial strains. With freshly isolated para-influenza bacilli, fermentation reactions were obtained only in peptone-water sugars enriched with yeast extract. Yeast extract as usually prepared is unsuitable as a source of the V factor for this purpose, as it contains a sucrose-splitting enzyme which is heat stable in acid solution.

Sensitivity of Rheumatic Subjects to Streptococcus Products.—Green states that of thirty-two cases of acute rheumatism, twenty-seven, fourteen and thirteen showed cutaneous sensitivity to endotoxin of autogenous hemolytic, viridans and indifferent streptococci, respectively. Of 105 patients with acute and subacute rheumatism 75 per cent gave positive cutaneous reactions with a stock preparation of hemolytic streptococcus endotoxin as compared with 24 per cent of 105 nonrheumatic controls. In a limited number of quiescent cases, local and general manifestations of the rheumatic syndrome have been induced by subcutaneous injection of hemolytic streptococcus endotoxin. The evidence supports the view that hemolytic streptococcus infection is an important factor in the production of the rheumatic state.

Lancet, London

2: 603-650 (Sept. 10) 1938

Treatment of Prostatic Obstruction. H. P. Winsbury-White.—p. 603.
Further Experiments on Administration of Hormones by Subcutaneous Implantation of Tablets. R. Deanesly and A. S. Parkes.—p. 606.
Tuberculin Patch Tests in Children. F. D. Hart.—p. 609.
*Effect of Hesperidin (Vitamin P) on Capillary Fragility. H. Scarborough and C. P. Stewart.—p. 610.
*Effect of Induced Hypercalcæmia on Excessive Psychomotor Activity. T. M. Cuthbert.—p. 612.
Monarticular Arthritis Associated with Dysenteric Bowel Infection. J. D. Benjafield and G. S. Halley.—p. 616.
Operative Treatment of Labyrinthine Vertigo. M. Yearsley.—p. 618.
Pneumococcic Meningitis Treated with 2-(p-Aminobenzenesulfonamido) Pyridine: Recovery. G. C. K. Reid, with a note by S. C. Dyke.—p. 619.
Pneumococcic Septicæmia: Id. S. C. Dyke.—p. 621.
Estimation of Hæmoglobin in Undiluted Blood, Using a Lovibond Comparator. G. A. Harrison.—p. 621.

Effect of Hesperidin on Capillary Fragility.—Scarborough and Stewart state that oral administration of hesperidin (vitamin P) reduced the number of hemorrhages in six patients with vitamin deficiency. This effect was observed when petechial hemorrhages were induced by the application of pressure and in spontaneous hemorrhages after the administration of arsenic or bismuth (hemorrhagic capillary toxicosis of Frank). In these cases the effect appears to be independent of the presence of ascorbic acid in the diet.

Hypercalcæmia and Excessive Psychomotor Activity.—There is some evidence that when increased nervous excitability exists induced hypercalcæmia exerts a sedative effect. Cuthbert induced hypercalcæmia in nineteen patients showing increased excitability. Six patients received 4 Gm. of calcium lactate and 6,300 international units of vitamin D daily. The dosage of parathyroid extract was regulated by frequent estimations of the blood calcium, varying from 10 to 110 units. Eleven patients were given 6 Gm. of calcium lactate, 6 ounces (180 cc.) of lactose (an attempt to promote intestinal acidity), 9,400 international units of vitamin D and from 4 to 6 Gm. of ammonium chloride. Injections of parathyroid extract were given every four hours and later every six or eight hours for from three to sixteen days. The efficiency of the medicinal therapy alone, without parathyroid extract, in promoting hypercalcæmia was observed in two patients. Eight patients were discharged within nine months of treatment; this is much higher than the hospital discharge-rate for the year. Eight other patients were greatly improved. A good response was obtained in nearly three fourths of the treatments given. The remissions arising with and after treatment were definitely longer than any spontaneous remissions before treatment, with one exception. When the percentage rise in blood calcium was more than 30 the period of maximal response was generally under ten days; when improvement commenced below this, the maximal response was more prolonged; thus if a rise of from 20 to 30 per cent in the blood calcium is obtained improvement follows. The only undesirable effects observed were drowsiness in one patient on the tenth day and vomiting in another probably due to acidosis. Treatment did not have to be curtailed because of these symptoms. The results suggest that once the parathyroid is stimulated into activity, activity persists for some time—from two to six weeks at least. Treatment was found most effective in the absence of hallucinosis. Some patients became resistant to parathyroid extract after heavy dosage for about twelve days. Results suggest that in treating future cases prolonged intensive medicinal therapy should be tried first; but if a more rapid result is desired parathyroid extract should also be given intramuscularly every four hours, the patient receiving about 150 units daily until improvement begins. The injections may then be given less frequently and smaller doses used. Every effort must be made to utilize the resulting period of remission, and the patient's fullest cooperation should be obtained.

Medical Journal of Australia, Sydney

2: 267-318 (Aug. 20) 1938

Toxic Goiter, with Special Reference to End Results. A. Newton.—p. 265.
Diagnosis of Poliomyelitis. M. L. Powell.—p. 276.
Infection with Trichomonas Vaginalis: Treatment with Silver Picrate. H. G. Furnell.—p. 284.

2: 319-360 (Aug. 27) 1938

Some Recent Advances in Therapy. A. W. Holmes à Court.—p. 319.
Simple Procedures in Treatment of Painful Feet. B. Koen-Cohen.—p. 325.
Painful Feet. E. E. Price.—p. 332.
The History of Renal Physiology. F. Arden.—p. 335.

2: 361-404 (Sept. 3) 1938

Factors in Prognosis of Cardiac Disease. A. W. Holmes à Court.—p. 361.
Some Observations on Examination of Men Exposed to Lead Hazard at Mount Isa, Including an Original Method for Examination of Blood for Polychromasia. L. A. Windsor-McLean.—p. 367.
Endemic Typhus in North Queensland. R. Y. Mathew.—p. 371.
*Intracutaneous Tuberculin Test of Mantoux: Method Employing a Single Injection. D. Anderson and C. Harvey.—p. 378.

Intracutaneous Tuberculin Test of Mantoux.—Anderson and Harvey devised a single injection technic for the Mantoux test, using purified protein derivative. This was employed in population surveys to detect a high percentage of the total positive reactors with a minimum of untoward reactions. They felt that a smaller injection ought to produce a correspondingly smaller allergic response in a susceptible subject as readily recognizable as that produced by the larger injection of the same strength. Accordingly 123 volunteers, some known reactors and some clinic patients not previously tested, were given into the right arm an injection of 0.005 mg. of tuberculin purified protein derivative in 0.1 cc. of diluent, and into the left arm an injection of 0.00125 mg. of tuberculin purified protein derivative in 0.025 cc. of diluent. The two injections were given at the same time. It was found to be easy to measure the smaller dose with as much or almost as much accuracy as the larger dose. From this experiment it is concluded that an injection of one fourth of the volume of the standard second strength injection of tuberculin purified protein derivative detects all or nearly all the reactors to the Mantoux test. The specificity of the smaller reactions is still unmistakable by the experienced interpreter. The sharper reactions are of substantially less severity. The scheme of dosage of Long, Aronson and Seibert should be followed when practicable, but if only one injection can be given this may safely and effectively consist of 0.00125 mg. of tuberculin purified protein derivative in 0.025 cc. of diluent. An experience of more than 1,000 such injections has shown that, though sharp reactions are relatively frequent, they are practically never large enough to be inconvenient and that the proportion of reactors is as great as with the larger injection. Of the first 500 adult subjects tested with the single injection technic thirty-three had some degree of vesiculation; of these the reaction was large and more or less sore in ten and in five some tenderness was complained of when the reaction was neither large nor vesicular. Only four subjects required treatment, three for blistering and one for itching.

Annales de Dermatologie et de Syphiligraphie, Paris

9: 657-768 (Aug.) 1938

*Vulvar Tuberculosis. J. Gaté and P. J. Michel.—p. 657.
Experimental Studies on Alteration of Cutaneous Reaction in Course of Repeated Irritations of Skin. L. Török with the assistance of D. Kenedy, E. Lehner, E. Rajka and F. Urban.—p. 677.

Vulvar Tuberculosis.—Gaté and Michel follow Bulkley's classification of vulvar tuberculosis. This author differentiated an ulcerous, an ulcerohypertrophic and a purely hypertrophic form but he also mentioned fistulas and abscesses and lupus of the vulva. Following a review of these different types of vulvar tuberculosis, the authors give detailed clinical histories of two cases of their own. In the first case, which concerned a young woman aged 19, the clinical picture suggested a primary tuberculosis. The anamnesis as well as a thorough clinical and roentgenologic examination gave no indication of a preexisting tuberculous infection. The onset of the pathologic manifestations was characterized by an erythema nodosum, which is one of the classic aspects of the primary complex. This erythema nodosum involved the lower extremities. The vulvar ulceration involved the left labium minoris. Moreover, there was an acute and suppurating adenopathy. The source of the tuberculous infection could not be determined. The woman's husband was examined but was found to be in perfect health. The second case of tuberculous ulceration in the region of the vulva concerned a young woman who had been married for seven months and whose husband had died one month after marriage from meningitis, which was probably of a tuberculous nature. The authors further review the clinical history of a case which was first described by Hellerstrom of Stockholm. In this case there existed a tuberculous ulcer of the vulva complicated by a tuberculous adenopathy of the inguinal region. This case is interesting not only because it was of conjugal origin but especially because a venereal lymphogranuloma was at first thought of. In the conclusion the authors emphasize once more the clinical polymorphism of vulvar tuberculosis, pointing out that this explains the occurrence of diagnostic errors. They stress that laboratory tests are helpful in avoiding diagnostic errors.

Journal de Médecine de Lyon

19: 507-526 (Sept. 5) 1938

*Dolichocolon and Painful Abdominal Crises. C. R. Bocca.—p. 507.

Dolichocolon and Painful Abdominal Crises.—Bocca maintains that if a barium enema discloses an elongation of the large intestine and perhaps the presence of curves, bends and S-shaped or figure 8-shaped loops, it is justifiable to affirm the existence of a dolichocolon. According to some authors, a dolichocolon is only a banal roentgenologic aspect without great pathologic significance. However, there are others who regard the dolichocolon as a morbid entity which is usually accompanied by clinical signs such as constipation, aerocoly and painful abdominal crises of a particular character. These painful abdominal crises are of three types: One group has the point of origin outside of the intestine. These patients may complain of dyspeptic disturbances, of hepatobiliary disorders or of pains in the ileocecal region. The second group has painful abdominal crises connected with colitis. Colitis is one of the most frequent complications of dolichocolon and it is especially grave, because its treatment is so difficult. The third group has painful crises of the subocclusive type. The author says that he observed this type of crisis in nine of twenty-nine cases of dolichocolon. In five of these nine cases the symptoms of occlusion concurred with those of colitis, but in the other four cases they existed alone; they had a tendency to recur and to disappear spontaneously. Discussing the complications that may arise from dolichocolon, the author mentions volvulus, adhesions, pericolitis and vascular complications. Regarding the diagnosis he says that it should be based on roentgenoscopy following an opaque enema. The treatment should be chiefly a medical one. The author mentions dietetic measures and also medicaments to reestablish the normal motility of the intestine. The value of enteroclysis is still in dispute. For the treatment of the abdominal crises, warm compresses and antispasmodics are recommended. The author says that in the noncomplicated cases of dolichocolon many surgeons recommend first a trial with medical treatment. In some complications such as volvulus a surgical intervention is necessary.

Presse Médicale, Paris

46: 1281-1288 (Aug. 24) 1938

*Lungs and Microbes. L. Binet and C. Jaulmes.—p. 1281.
Circumscribed Lipo-Atrophy of Insulinic Origin. L. Cornil.—p. 1282.

Action of Isolated Lung on Micro-Organisms.—Binet and Jaulmes report their investigations on the microbicidal power of the isolated lung, which they carried out during the last two years. After describing their technic of the perfusion of the isolated lung, they state that their microbicidal studies were made with the following micro-organisms: hemolytic streptococcus, Staphylococcus aureus, bacillus of swine erysipelas, bacillus of anthrax, Bacillus pyocyaneus and enterococcus. They found that a lung which is aseptically isolated, rhythmically ventilated and continuously perfused with citrated blood, and which is kept under physiologic conditions as regards temperature and hydration, is capable of exerting an influence on the micro-organisms that are added to the blood of perfusion. The different micro-organisms disappear progressively from the blood that perfuses the lung. The authors think that various factors play a part in this gradual disappearance of the micro-organisms: a hematic factor (action of leukocytes and thrombocytes), a respiratory factor (influence of the composition of air which circulates in the lung) and a pulmonary factor proper. It was further observed that if a suspension of carbon or of india ink was added to the perfusing blood twenty or thirty minutes before the introduction of the micro-organisms, the disappearance of the bacilli from the blood was hindered or at least retarded. This reduction in the microbicidal power, following the introduction of india ink is probably the result of the blockage of the reticulo-endothelial system.

46: 1329-1344 (Sept. 7) 1938

Hemolytic Anemia with Hemoglobinuria and Hemosiderinuria: Case. M. Brulé, P. Hillemand and R. Gaube.—p. 1329.
*New Test of Hepatic Insufficiency: Test of Provoked Levulosemia. R. Rivoire, R. Gayet, A. Bermond and F. Moreau.—p. 1331.

New Test of Hepatic Insufficiency.—Rivoire and his associates suggest a new test for the detection of hepatic insufficiency. It consists in determining in the blood of the patient, at half-hour intervals for a total period of two hours, the degree of levulosemia, after the ingestion of a quantity of levulose, equivalent to 50 cg. per kilogram of body weight. The more accented the curve of levulosemia, the greater is the hepatic insufficiency. This test is based on a well known phenomenon, namely the fixation of levulose by the liver (identical or analogous to that of dextrose or galactose); but, whereas the dextrose content of the blood is determined, in addition to the hepatic fixation, by multiple other extrahepatic factors, it appears that these factors have no effect whatever on the levulose content of the blood. This property of levulose has been employed previously in tests on hepatic insufficiency, namely in the provoked levulosuria. However, when the sensitivity of this test did not prove to be superior to provoked galactosuria, it was abandoned in favor of the latter. The authors made fifty tests with provoked levulosemia. They found that outside of hepatic insufficiency only slight variations in the provoked levulosemia curve exist. In fasting persons, no levulose is detected in the blood; at the most, traces are found in some subjects. After ingestion of levulose, it appears in the blood at the end of twenty or thirty minutes and reaches its maximum of from 10 to 15 mg. per hundred cubic centimeters of blood at the end of the first hour, after which it subsides again or reaches less than 6 mg. at the end of the second hour. However, in cases of hepatic insufficiency, the levulosemia reaches 40, 50 or even 60 mg. at the end of the first hour. It is extremely inconstant and in severe cases it may be greatly prolonged so that it is still observable at the end of the third hour, but the authors think that it is the peak of the hyperlevulosemia, which is characteristic for hepatic insufficiency. They admit that this test requires further investigations but they have found that levulosemia is positive in about one of two cases of certain hepatic disorders in which the galactosuria test produces negative results, but they never observed the opposite phenomenon. They conclude that provoked levulosemia is a more sensitive test than are those previously proposed for the detection of hepatic insufficiency.

Revue Neurologique, Paris

70: 1-148 (July) 1938

Hemiballism and the Subthalamus. H. Marcus and H. Sjögren.—p. 1.
Meralgia Paresthetica in Course of Aneurysm of Abdominal Aorta. A. de Castro.—p. 29.
*Role of Hypertonic Solutions in Treatment of Migraine. G. Villey, J. F. Buvat and Mme. Buvat-Pochon.—p. 32.

Hypertonic Solutions in Migraine.—Villey and the Buvats report the results that they obtained with the intravenous injection of hypertonic solutions of sodium chloride in the course of attacks of migraine. They present a detailed clinical history which suggested to them that the disturbances presented by this patient were related to a paroxysmal attack of intracranial hypertension. Accordingly, they subjected the patient to intravenous injections of hypertonic solution of sodium chloride from the beginning of the painful period of his attack. The pain ceased during the first hour after the injection; the subconfusional condition disappeared within several hours. The authors treated the patient in this manner for a year; at each of their treatments, the pain subsided in from twenty to forty minutes; the effect on the state of confusion varied. They further cite the clinical histories of several other patients who had migraine of a more typical character. The histories indicate that 20 cc. was the dose usually administered by intravenous injection; the concentration of the solution was either 10 per cent or 20 per cent.

Minerva Medica, Turin

2: 133-156 (Aug. 11) 1938

*Nervous Forms of Pellagra Cured by Nicotinic Acid. G. Frontali and G. Ferrari.—p. 133.
Dynamic Auxiliary Therapy in Course of Balneotherapy and Lutotherapy in Salt and Iodine Waters. A. Mosetti.—p. 148.

Pellagra.—Frontali and Ferrari administered the nicotinic acid treatment to fourteen adults (men and women) who were suffering from grave forms of nervous pellagra, either primary or recurrent. The disease was of long duration in all cases and had resisted the commonly used antipellagragenic diet and also the polyvitaminic preparations. All the patients had nervous disorders. Three with a demential form of pellagra had some ancestors or relatives with psychoses and pellagra. Seven patients were suffering from amentia and mental depression. Two pellagrous alcoholic patients had delirium and hallucinations. The treatment consisted in daily administration of 160 mg. of nicotinic acid for from thirty to fifty days. Every day 40 mg. of the acid was administered intramuscularly and 120 mg. of the acid was given by mouth. The treatment was given in the course of a pellagragenic diet in four cases and in the course of the common antipellagragenic diet in ten cases. The following results were obtained from the treatment in all cases: (1) complete elimination of the pellagradermal lesions within one or two weeks, (2) restoration of normal function of digestion within from thirty to thirty-three days and (3) slow but constant regression of the nervous symptoms. By the end of the treatment the patients had gained from 5.5 to 8 Kg. Asthenia, hypertonia, paralyzia and pain disappeared. As to the mental disorders the treatment failed in dementia. Amentia and mental depression were controlled without residual mental disorders. The authors show the advisability of administering the treatment early in the development of the disease before irreversible changes of the nervous tissues take place. They believe that the results of the treatment are permanent if the patients have an antipellagroid diet for life. Otherwise the administration of a quantitatively sufficient and qualitatively well balanced pellagragenic diet has to be complemented with nicotinic acid for an indefinite time.

Rinascenza Medica, Naples

15: 505-540 (Aug. 15) 1938

Milkers' Nodules: Case. E. de Gregorio and R. de Blasio.—p. 511.
*Toxic Action of Aminopyrine on Blood. A. Pouchè.—p. 512.
Scoliosis in School Children. A. Curcio.—p. 516.

Toxic Action of Aminopyrine on Blood.—Pouchè says that aminopyrine, when administered in a therapeutic dose, may induce leukopenia with hypogranulocytosis. He administered a daily dose of 0.1 Gm. to ten normal infants for ten consecutive days. He made determinations of the values of the leukocyte on the first, fifth and last days of the treatment. In two of the cases leukopenia with hypogranulocytosis resulted from the treatment. In one of the cases leukocytes and granulocytes, which were 11,200 and 4,200 respectively before administration of aminopyrine, diminished to 5,488 and 462 respectively on the tenth day of the treatment. As the administration of the drug was discontinued, the granulocytes returned to normal values. The author believes that patients who react with leukopenia and hypogranulocytosis to aminopyrine have a special sensitivity to it, and he points out the possible danger in administering the drug.

Rivista di Patologia e Clin. Tubercolosi, Bologna

12: 527-608 (Aug. 31) 1938. Partial Index

Histogenic Reactions of Tuberculous Allergy. E. Frola.—p. 527.
Sodium Acetate in Cultural Differentiation of Tubercle Bacilli of Human and Bovine Types in Petragnani's Culture Medium. A. Rosa and R. Maccolini.—p. 539.
Behavior of Fibrinogen in Course of Pulmonary Tuberculosis. M. Anzilotte.—p. 545.
*Cavitation and Phthisiogenesis in Children and Adolescents. E. Filla.—p. 566.

Tuberculous Cavitation of Lung in Children.—Filla reports eighty cases of pulmonary tuberculous cavitation in children ranging in age from 2 to 15 years. The condition is more rare in children before the age of 8 years than in older children. In the majority of the cases the caverns originate in an early tuberculous infiltration of the parahilar or subclavicular zones of the lung. Only in rare cases the infiltration takes place at either the apex or the base of the lung, or it originates in the form of pulmonary tuberculosis other than an early tuberculous infiltration. The exudative and the fibrous forms are the most frequent forms of pulmonary tuberculosis in children. The prognosis is serious. The largest frequency of the development of the disease coincides with sex maturity. The disease is more serious in girls than in boys. Recovery takes place in about 25 per cent of the cases if the diagnosis is made early and the patients are cared for in antituberculous institutions for a long time. When the disease develops in adolescents they rarely reach the adult stage. The author points out the importance of preventing the disease and also of an early diagnosis. He emphasizes the advisability of making repeated systematic clinical and roentgen examinations of the thorax of children at the prepuberal age.

Revista de Tuberculosis del Uruguay, Montevideo

7: 1-110 (No. 1) 1938. Partial Index

*Roentgenogram of Dry Hydatid Cyst of Lung. O. Ivanissevich.—p. 6.
Recurrent Large Hemoptysis from Remains of Hydatid Cyst of Lung: Immediate Cure After Phrenectomy. L. Muñoz Morstorio and S. Grezzi.—p. 20.
Technic of Lamas and Mondino's Two Stage Operation for Hydatid Cysts of Lung. D. Prat.—p. 28.
Luxation of Azygos Lobe: Treatment by Artificial Pneumothorax. M. S. Olivera.—p. 90.

Roentgen Shadow of Dry Hydatid Cyst of Lung.—Ivanissevich says that there is a sign of value for the roentgen diagnosis of incarcerated dry hydatid cyst of the lung. According to the author, when the fluid of an echinococcus cyst of the lung is spontaneously eliminated, the cystic membrane collapses and becomes incarcerated by the adventitial layer of the lung. The roentgen shadows of uncomplicated hydatid cysts of the lung, as well as of cancer of the lung, are round with dark regular smooth borders when the roentgenograms of the thorax are taken in the anteroposterior and lateral positions. Those of dry incarcerated hydatid membrane of the lung are round when the thorax is taken in the anteroposterior position and polygonal with irregular light borders when a lateral view is made. The small borders of the membrane, which are not imprisoned by the adventitial layer of the lung, project out through one or various bronchial branches. The author believes that the special shadow is due to the different distribution of the planes of elastic tension in the lung in relation to the position of the structure in the thorax as the volume of the lung adapts itself to the conditions of internal collapse of the dry hydatid membrane.

Archiv für Dermatologie und Syphilis, Berlin

178: 1-98 (Aug. 20) 1938. Partial Index

*Eczema in Bricklayers. W. Burckhardt.—p. 1.
*Chemotherapy of Gonorrhea with Sulfanilamide Compounds, Particularly with Diseptal C (D B 32). H. Felke.—p. 45.
History of Osler's Disease (Hereditary Hemorrhagic Telangiectasia). A. Fingerland and B. Janoušek.—p. 54.
Nonhereditary Epidermolysis Bullosa in Cutaneous Amyloidosis. A. Marchionini.—p. 65.
Clinical Aspects and Pathogenesis of Rare Cutaneous Pustuloses. H. Fuhs.—p. 68.
Sarcoid-like Cutaneous Tuberculosis Caused by Chicken Tuberculosis. N. Danbolt and Anton Brandt.—p. 76.

Eczema in Bricklayers.—Burckhardt presents an analytic and experimental study of the occupational disease of the skin of bricklayers, the so-called cement-lime eczema or bricklayers' eczema. In studies on the causes of this disorder, simple toxic as well as allergic factors were investigated. Tests were made on eighty patients with bricklayers' eczema and on 100 healthy controls. The patients with bricklayers' eczema had only a slight hypersensitivity to cement, lime and their constituents, but they had a lowered cutaneous resistance and a hypersensitivity to alkaline substances. Tests revealed that cement and lime produce in every person an eczematoid dermatitis and that 90 per cent of the patients with bricklayers' eczema reacted to application of cement or lime with these ordinary toxic reactions. Thus there was no allergic hypersensitivity to cement and lime in 90 per cent of the patients with bricklayers' eczema; they merely had ordinary toxic hypersensitivity to these substances which was the result of their lowered resistance to alkaline substances. Only eight of the patients (10 per cent) responded with eczematous reactions to cement and lime. In seven of these there existed in addition to the bricklayers' eczema seborrheal eczema or obscure endogenic eczematoses. Thus there was a possibility that the eczematous reactions developed on the basis of an isomorphic irritation. In only one case did the conditions indicate the existence of a true allergy against alkaline action or against bodies that originate as the result of the toxic effects of these alkaline substances on the skin. The author suggests that besides alkali, the calcium ion plays a part in the toxic action of cement and lime on the skin, because calcium chloride likewise produces eczematoid cutaneous reactions and the concentrated cement and lime suspensions are rich in calcium ions. The author concludes that the diagnosis of bricklayers' eczema should be based chiefly on the anamnesis and the clinical picture. He thinks that the patch tests serve only for more detailed studies. Protection of the skin against massive contact with cement and lime is usually an adequate prophylaxis against bricklayers' eczema.

Chemotherapy of Gonorrhea.—Felke employed three different sulfanilamide preparations (diseptal A [dimethyl disulfanilamide], B [monomethyl disulfanilamide] and C [disulfanilamide]) on 270 patients with gonorrhea. Having found diseptal C, also referred to as D B 32, to be the most effective of the three, he has employed this preparation exclusively since December 1937. He found that a daily dose of 1.5 Gm. (given in three doses of 0.5 Gm. each, at eight hour intervals) produced an average concentration of free D B 32 of from 1 to 1.5 mg. per hundred cubic centimeters of serum. When the concentration reached 2 mg. per hundred cubic centimeters, cyanosis usually resulted. The author adhered to the short term administration; the daily dose of 1.5 Gm. was usually given for six days; that is, 9 Gm. of the medicament was regarded as a therapeutic "thrust." When a second thrust became necessary, the author increased the daily dose to 2 Gm. and continued this dose for four days. He says that in a third thrust, the daily dose may even be increased to 3 Gm. (three days). He explains why this is possible and then describes observations on twenty women with gonorrhea who were treated with daily doses of 1.5 Gm. Discussing these and also sixty-five cases of gonorrhea in men, who were treated likewise with diseptal C, he mentions the importance of the so-called therapeutic maturity. This implies that in order to be effective the chemotherapy should not be begun too early. A summary report of the sixty-five cases of gonorrhea in men indicates that when the medication with diseptal was begun from the eleventh day on, the treatment was generally more effective than when it was begun before this time. When chemotherapy was begun too early the majority of patients required two or more therapeutic courses, whereas when it was begun later, one course was adequate in the majority of cases. In the conclusion the author states that in men the chemotherapy should be combined with local treatment but that in women such treatment is superfluous, except that in new cases simple vaginal irrigations may be given. The development of an undesirable resistance of the organisms can be prevented by avoiding insufficient doses.

Nervenarzt, Berlin

11: 385-440 (Aug. 15) 1938

Clinical Aspects of Cerebral Metastases of Carcinoma. K. E. Pass.—p. 385.
*Epileptiform Attacks in Insulin Therapy of Schizophrenia. Gerty Gross-May.—p. 400.
*Treatment with Vitamin B1 in Delirium Tremens. J. Kloster.—p. 413.
So-Called Reflex Epilepsy. K. Hebel.—p. 415.

Epileptiform Attacks in Insulin Therapy of Schizophrenia.—Gross-May says that of 105 schizophrenic patients who were subjected to insulin therapy, thirty-seven had one or more epileptiform attacks in the course of the treatment. The occurrence of these attacks showed no dependence on the age and sex of the patient and no relation to the dose or type of insulin, to the blood sugar content or to the atmospheric conditions. On the other hand, it cannot be ruled out that epileptic heredity produces a predisposition. However, the author emphasizes in this connection that there are considerable clinical differences between a true epileptic attack and the epileptiform hypoglycemic crisis. Depending on the time of appearance of the attack, she differentiates two groups of patients, those with early and those with late epileptiform attacks. In the first group, the attacks develop between the second and the third half hour after the injection of insulin, in the second group between the second and the fourth hour. In women the relatively early attacks are more frequent, in men the late attacks. Evaluating the therapeutic significance of the epileptiform attacks, the author says that the results are somewhat better in the patients in whom these attacks develop than in those in whom they do not. However, this more favorable prognosis is partly explained by the fact that the duration of the schizophrenia was on the average shorter in the persons who reacted with epileptiform attacks. If an attack is immediately followed by an improvement, the prognosis is favorable. In some cases the attack may be followed by an exacerbation. In cases in which the attacks occur early, the danger of somatic damage is slight, but in the late cases measures should be taken immediately to prevent such damage. If, however, attacks are desired for therapeutic reasons, the insulin shock therapy should be combined with the administration of metrazol.

Vitamin B_1 in Delirium Tremens.—After pointing out that vitamin B_1 is now widely used in the treatment of alcoholic polyneuritis, Kloster says that he tried vitamin B_1 in the treatment of delirium tremens. Following the description of a case in which the intravenous injection of 50 mg. of crystallized vitamin B_1 produced favorable results, he says that vitamin B_1 was employed also in ten patients in whom delirium tremens had not yet completely developed. In three of these patients a surprising improvement was noticeable one or two hours after the injection; the psychic unrest was much improved, and the tremor and the intoxicated appearance were lessened. Moreover, eight of the ten patients slept quietly the first night after the administration of vitamin B_1. Large doses (from 20 to 80 mg.) of a synthetic vitamin B_1 preparation were injected intravenously from one to three times at intervals of an hour. The author further cites another patient with the symptoms of delirium tremens, in whom vitamin B_1 was employed with good results. He realizes that this material is too small to permit a definite evaluation of the treatment of delirium tremens with vitamin B_1, but he hopes that the treatment will be tried by others. He regards the fact that vitamin B_1 apparently causes

no undesirable secondary effects and the fact that as yet there is no thoroughly satisfactory treatment of delirium tremens as additional justification for a trial of the treatment with vitamin B_1.

Zeitschrift für klinische Medizin, Berlin

134: 533-670 (Aug. 8) 1938. Partial Index

Question of Nephrosis. T. Fahr.—p. 533.
Agranulocytosis. K. A. Seggel.—p. 563.
Studies on Normal and Pathologic Physiology of Gastric Movements: Observations on Blood Sugar Level, Gastric Motility and Gastric Disturbances. F. Brauch.—p. 581.
*Angina Pectoris Simplex and Hemodynamic Load of Heart. W. Raab.—p. 595.
*Changes in Blood During Necroses in Cardiac Muscle and in Striated Muscles. W. Hauss and T. Yamanaka.—p. 604.
Value of Roentgenology in Diagnosis of Diseases of Small Intestine. G. Wachner and S. Zellner.—p. 634.
Relations Between Pernicious Anemia, Gastric Polyps and Gastric Carcinoma. G. Velde.—p. 653.

Angina Pectoris Simplex.—Raab applies the term angina pectoris simplex to those forms of typical stenocardiac disorders which are not caused by acute coronary thrombosis, hypertensive crisis or a mitral defect but occur during physical exertions, excitement, after heavy meals, under the influence of low temperatures or even without recognizable causes. The opinion prevailing today is that angina pectoris simplex is the result of a disparity between the cardiac function and the coronary blood perfusion; that is, of an excessive hemodynamic load on a cardiac muscle, the blood perfusion of which is inadequate, because of a stenotic condition in the coronaries. The author concedes that the presence of an excessive hemodynamic load probably plays a part in the majority of cases of angina pectoris but that, on the other hand, it should not be overlooked that increase in blood pressure and in the beat frequency may be absent during the attack and that even the electrocardiographic aspects of hypoxemia of the cardiac muscle may be absent during rest as well as during the work test or during the spontaneous attack. The investigations described in this paper were made to determine whether excessive hemodynamic loads are absolutely essential in the development of stenocardiac symptoms of the type designated as angina pectoris simplex. Summarizing his observations, the author says that in cases of angina pectoris simplex the behavior of blood pressure and pulse frequency, on the one hand, and the appearance of stenocardiac symptoms during a spontaneous attack or after a work test, on the other hand, frequently show no interrelationship. Considerable prolonged improvement or complete disappearance of the symptoms of angina pectoris, for instance after the irradiation of the adrenals, occurs in angina pectoris with hypertonia often without a decrease in the hypertension. In angina pectoris with normal tension and cardiac compensation, the decrease or disappearance of the symptoms is accompanied by a gradual increase in the pressure. Among 130 patients with angina pectoris, there were only 43 per cent in whom the systolic pressure was permanently in excess of 160 mm. of mercury. Thus the author arrives at the conclusion that in many cases of angina pectoris simplex excessive hemodynamic loads on the heart play no part in the pathogenesis.

Blood During Muscular Necrosis.—Hauss and Yamanaka point out that the relations between myocardial necrosis, electrocardiogram and hematic changes have not been completely explained as yet. In order to gain insight into these relations, the authors made studies on twenty-five patients with myocardiac infarct. They watched for changes in the temperature, number of leukocytes, sedimentation speed, blood sugar, rest nitrogen and sodium chloride content of the blood. The values detected by them corresponded largely to those which they found reported in the literature. Discussing the diagnostic and prognostic significance of the observed changes, they state that although fever is of considerable significance for the diagnosis of myocardial infarct it is of no prognostic significance. With regard to the leukocyte count, the conditions are similar. The sedimentation speed is of great diagnostic value because its acceleration generally persists for weeks; that is, as long as necrotic substances are being absorbed. The authors advise rest in bed until the sedimentation values are normal. Fluctuations in the blood sugar values are of no prognostic significance but an increase in the rest nitrogen content seems to indicate an unfavorable prognosis. In order to determine the causes of the changes, the authors induced small sterile muscular necroses on the thigh of dogs and thus produced fever, acceleration of the sedimentation speed and increases in the leukocyte count, the blood sugar and the rest nitrogen. Since these changes largely resemble those observed in cardiac infarct, the authors think that a resorption of necrotic substances is responsible for these symptoms in patients with cardiac infarct as well. The fact that the entire organism is involved in the reaction is considered to be a result of the vasomotor action of the products of decomposition.

Vestnik Khirurgii, Leningrad

58: 373-514 (April) 1938. Partial Index

Repair of Traumatic Defects of Skin. S. M. Kalmanovskiy and E. L. Zhak.—p. 375.
Role of Anaerobes in Noma. A. M. Geller and T. I. Medvedeva.—p. 380.
Topography of Peripheral Branch of Facial Nerve. A. V. Shilova.—p. 391.
Roentgenologic and Surgical Treatment of Cancer of Breast According to Wins. N. N. Tsucherako, N. N. Sokolov, E. D. Dubovyi and L. E. Korythin-Novikov.—p. 395.
*Intraperitoneal Adhesions. S. A. Abramovich.—p. 402.

Intraperitoneal Adhesions.—Abramovich produced adhesions in the peritoneal cavity of dogs by various methods such as the introduction into the cavity of sterile foreign bodies, swabbing the serosa with a 5 per cent solution of pepsin, with tincture of iodine or with alcohol, or by scarifying the serosa of an intestine on one or both sides. The abdomen was closed without drainage and a relaparotomy was performed at intervals of from three weeks to four and one-half months. The author found that sterile foreign bodies became encapsulated by adhesions of firm connective tissue and were surrounded by the omentum. The effect of the pepsin solution was to produce delicate, easily separable adhesions. Application of tincture of iodine did not always result in adhesions and such as were formed were delicate and readily separated. Swabbing the peritoneum with alcohol or introducing of small amounts of it (from 5 to 10 cc.) caused the formation of wide and firm adhesions. Scarification of one side did not produce adhesions; when opposed sides in contact with each other were scarified, dense adhesions resulted. The introduction of petrolatum did not prevent the formation of adhesions. Free omental transplant to a defect in the serosa covering of the intestine likewise failed to prevent adhesions. The use of a 0.5 or 1 per cent Payr's pepsin-Pregl solution in dividing adhesions resulted in their reformation. The author concludes that there is no substance capable of preventing the formation of adhesions in the peritoneal cavity. He therefore stresses their prophylaxis in the careful handling of the serous surfaces, in careful hemostasis, in avoidance of trauma, in drying the peritoneal surfaces and in the use of tampons and drains. In the postoperative period prophylactic measures consist in encouraging early rising from bed and the early function of the intestine through feeding.

Hospitalstidende, Copenhagen

81: 773-788 (Aug. 16) 1938

*Calvé-Perthes Disease After Fracture of Neck of Femur in Young Persons and Its Significance for Understanding of Pathogenesis of Aseptic Necrosis of Epiphysis. B. Nielsen.—p. 773.

Calvé-Perthes Disease.—Nielsen reports two cases of Calvé-Perthes disease in boys after fracture of the neck of the femur. He concludes that the most probable cause of this disease after fracture is a lesion of the nerves of the afferent blood vessels. Functional disturbances occur which result in reduced nutrition of the bony tissue and consequent pathologic changes, including increased calcium content. The cases of clearly traumatic origin, he says, do not allow the conclusion

that the necrosis of the epiphysis in other cases is due to trauma. There is evidence that the disorder depends on hereditary anomalies of development; the cause is believed to be connected with the unknown processes which determine normal development. Calvé-Perthes disease with changes in the acetabulum and in the upper part of the neck of the femur is regarded as the result of more extended disorder of the nerves and of the blood vessels. Differences in the blood vessel supply of the epiphysis seem to explain the differences between some of the secondary necroses in adults and those in children.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 3931-4054 (Aug. 13) 1938

Congenital Passive Immunity. J. J. Van Loghem.—p. 3935.
Concealed Hyperthyroidism. J. B. Polak.—p. 3940.
Extensive Gold Dermatosis with Pigmentation Resembling Lichen Ruber Verrucous After Administration of Gold Preparation. R. Kooij.—p. 3945.
*New Observations and Studies on Familial Nuclear Anomaly of Leukocytes (Pelger-Huët). S. J. Leitner and P. C. Gugelot.—p. 3953.
Tuberculosis and Aneurin (Vitamin B1) Metabolism. J. Goudsmit.—p. 3964.
Treatment of Disturbances of Sexual Function in Males. A. H. Fortanier.—p. 3971.
Injections of Progesterone as Substitute for Corpus Luteum. W. C. Kors.—p. 3976.
Primary Chronic Infectious Polyarthritis: Case. J. H. Van Gortel.—p. 3977.

Familial Nuclear Anomalies of Leukocytes.—Leitner and Gugelot direct attention to the nuclear anomaly of the leukocytes which was first described by Pelger in 1930 and the familial nature of which was demonstrated by Huët in 1932. After citing other observers who have made reports on this anomaly, they say that in their own studies on the familial nuclear anomaly of the leukocytes they examined seventeen patients who belonged to three families. The anomaly consists in an inhibition of the segmentation, so that the blood contains only staff-nuclear cells and cells with two-segmented but rarely with three-segmented nuclei. The shape of the nucleus is characterized in the segmented ones by short, plump, round symmetric fragments, connected by a thin chromatin thread, in the staff-nuclear cells by a thinner divided one with thickened terminations. While the nuclear shape is still in a young stage, the structure of the nucleus has all the signs of maturity, namely, high chromatin content, coarse lamella formation or even signs of hypermaturity; that is, pyknosis. This dissociation between the degree of maturity of the shape and structure of the nucleus is the most characteristic aspect of the familial nuclear anomaly of Pelger-Huët. The heredity is dominant and not sex linked. In spite of the fact that tuberculosis occurred in the three families studied by the authors, a direct relation with this or other diseases cannot be detected, because the anomaly has been observed also in entirely healthy families. The examination of the bone marrow revealed that in the Pelger-Huët anomaly not the discharge of cells from the bone marrow is abnormal but rather the formation of the cells. In the sternal punctate the myelocytes and the metamyelocytes are increased at the expense of the staff nuclear and the segment nuclear. The typical nuclear structure is observed occasionally already in the myelocytes but generally in the metamyelocytes. The neutrophil as well as the eosinophil and the basophil elements are involved. The functional test by means of intracutaneous tuberculin injections resulted in a deviation toward the left in the leukocytic blood picture, although to a lesser degree than did the treatment with a bacillary vaccine, the latter causing a great increase in myelocytes and metamyelocytes. Tests on the peripheral and medullary blood disclosed that the cells with mature nucleus phagocytize as severely as do the normal leukocytes of control persons. However, the immature cells from the bone marrow do this inadequately. Consequently, as soon as a strong mobilization of the leukocytes takes place, the defense of the organism may be inadequate. Not only has a knowledge of the anomaly differential diagnostic significance but it is also of scientific interest in that it is the first discovered hereditary anomaly of the leukocytes.

Ugeskrift for Læger, Copenhagen

100: 925-954 (Aug. 18) 1938

*Erroneously Diagnosed Cranial Tumors. K. H. Krabbe and M. Ellermann.—p. 925.
Cardiac and Respiratory Neurosis. H. Heckscher.—p. 930.
Perinephric Abscess with Opening into Bronchus. K. T. Petersen.—p. 937.
Treatment of Acne Vulgaris Juvenilis with Thyroidin. S. N. Vendel.—p. 939.

Erroneously Diagnosed Cranial Tumors.—Of the eighteen cases of cranial tumors described by Krabbe and Ellermann, fourteen had been diagnosed as vascular diseases of the brain, two as cerebrospinal syphilis, one as epidemic encephalitis and one as disseminated sclerosis. In all necropsy disclosed tumor of the brain, in the last case coincident with the disseminated sclerosis. The authors find that hemiparesis of acute onset in an older person without signs of choked disk may be due to a multiform glioblastoma in a cerebral hemisphere. If the albumin count is more than 20 and the picture nevertheless is that of a thrombosis rather than of hemorrhage in the brain, a tumor may be present, and the probability of a tumor is strengthened if the patient is increasingly dull, exhausted and confused. Multiform glioblastomas, however, are usually inoperable. In cases in which there is meningioma there is a certain intermittence in the symptoms, especially at the start; otherwise there is steady progression. When there are chronic extended cerebral symptoms an intracranial tumor may be probable; in rare cases meningiomas may also have an acute start and rapid course. In syphilitic patients with cerebral symptoms the possibility of a tumor should not be overlooked.

100: 955-988 (Aug. 25) 1938

Pneumonia Studies: IV. Continued Investigations on Croupous Pneumonia, Especially Concerning Treatment with Pneumococcus Rabbit Serum. N. I. Nissen.—p. 955.
*Experiences with Serum Treatment of Croupous Pneumonia. W. T. Andersen.—p. 966.
Cases of Grave Recurrence of Rectal Prolapse. C. C. Fleischer-Hansen.—p. 969.
*Auscultation of Cranium as Part of Neurologic Examination. T. Dalgaard-Nielsen.—p. 971.
Prognosis of Treated Syphilis. E. Lomholt.—p. 975.
Application of Isotonic Sodium Bicarbonate Solution in Treatment of Diabetic Coma. E. Kirk.—p. 977.
Allergy and Gastric Ulcer. O. S. Olesen.—p. 978.
Prescription Sign. H. W. Tetens.—p. 980.

Serum Treatment of Croupous Pneumonia.—In forty-one of sixty patients with acute pulmonary diseases Andersen found pneumococci of different types, most often types I, VII and III. Pneumococci were demonstrated in thirty of the thirty-four patients with croupous pneumonia, and twenty-four were treated with type specific rabbit serum. In the patients with type III the effect was negative or doubtful; in the others good, with a few exceptions. The importance of an early start of the serotherapy was demonstrated. About 80 per cent of the patients had serum sickness about ten days after the treatment, and in two cases this contributed to the fatal outcome. There were only two deaths in the remaining twenty-two cases, both in cases considered hopeless at the start of treatment. Complications were rare. The author concludes that treatment with type specific serum is a definite therapeutic advance, especially if the serum production is improved so that the grave serum conditions can be avoided; till then, extreme care is called for in treatment with serum of type III.

Auscultation of Cranium.—Dalsgaard-Nielsen says that sounds within the cranial blood vessels demonstrable on auscultation should always suggest a possible vascular tumor but cannot be regarded as pathognomonic, as illustrated in the last two of his six cases, in which the cause of the sound was hydrocephalus and hypertonia, in the one case due to a stenotic aqueduct, in the other to a cerebellar tumor. A cause other than vascular tumor must be suspected in those cases in which a sound within a blood vessel is audible on both sides of the cranium and may be affected by compression of both the right and the left carotid in such a way that the sound disappears on the side on which the carotid is compressed.

THE STUDENT SECTION

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Intern Training: Its Organization

K. WINFIELD NEY, M.D.
AND
DONALD E. BRACE, M.D.
NEW YORK

A certain amount of intern training has been the accepted procedure in most hospitals as a recompense, largely, for intern service. The intern usually has accepted such instruction and experience as have happened to come his way. Seldom has intern instruction had coordinated supervision or even organization. Recently, medical educators have become conscious of certain deficiencies in undergraduate instruction and have felt the necessity of rounding out didactic instruction by practical clinical training, in the endeavor to endow the prospective physician with some practical application of the theoretical achievements of medical school. Mastery of any practical science like medicine is evidenced largely in the ability to conduct skilfully those various technics and procedures which make it applicable, and the degree of this mastery only too often determines the difference between success and failure in practice. The recent graduate is supposed to have, and probably does have, considerable theoretical knowledge regarding medical procedures and their underlying scientific principles; he often, however, has little conception of their practical application. While a student may acquire scientific concepts through lectures and reading, no amount of such study will endow him with a mastery of the art of their application. These various skills which are so essential to medical practice are, or should be, obtained largely by observation and carefully supervised application, made possible during an internship and residency. The intern should realize that his internship may be his only opportunity to develop a skilful mastery of those various technics and procedures which constitute the art of medicine.

Staff members should appreciate the importance of intern training, not solely because of the assumed obligation in accepting intern service, but because much of the efficiency of a service depends on the skill exercised by the intern in the execution of various necessary routine procedures. However well a service may be organized, its efficiency depends largely on those less conspicuous activities which ordinarily are considered as resident and intern duties. The attitude of a service chief toward the intern too often has been the relation of master and servant, while it should be that of master and pupil. The efficiency of intern service rests largely on the intern's conviction that he is doing important and necessary work which is duly appreciated, and that he is really being compensated for this service in practical training.

Very few interns are able to appreciate the relative importance of the various procedures which they observe in their hospital work. They often are impressed with spectacular surgical procedures, or perhaps even with the personality of some members of the staff, and may devote their time largely in specialized subjects, to the exclusion of fundamental procedures which later will be required in practice, and on the acquirement of which their medical careers greatly depend; thus, through lack of organized teaching, an internship may be practically wasted. Interns often value a surgical service solely on the number of operations they are allowed to do, little realizing that the actual mechanics of most surgical procedures might readily be executed by an artisan totally untrained in those fundamental principles which determine why and when a given surgical procedure is to be instituted. If this lack of comprehension of relative values existed in medical practice, as it so often does in surgery, the intern might, on a similar basis, value his medical internship on the number of prescriptions he has been allowed to compound.

ORGANIZED GRADUATE TRAINING FOR INTERNS

In instituting graduate instruction arranged for intern training, certain objectives should be kept in mind:

1. In a mixed, or rotating, type of internship the intern should be expected to master the art of certain fundamental technics and procedures as they pertain particularly to each service. The chief of service, with the staff, should therefore outline those fundamentals which an intern should master while on that service. These may be called minimal essentials.

2. In order that the intern's activities be properly supervised and checked, an intern instructor is appointed and assumes the responsibility of the administration of intern instruction in each service.

3. While in any given service the intern, under supervision, will naturally be expected to master certain technics and clinical procedures. The chief of the service, however, should be assured that the intern obtains a comprehensive view of the whole case picture and appreciates the relative value of the various procedures used as they apply to examination, diagnosis and therapy, and, to this end (at least on all staff cases), a summary sheet is filled out by the intern showing positive clinical observations, the pathologic condition (suspected or proved), the therapy instituted and the results. At the completion of each service the intern will submit to the chief of that service a certain number of concise case summaries, each giving an intelligent perspective of a certain assigned case.

4. It is of utmost importance in all teaching to correlate the relationship between disease and symptoms and endeavor to determine the cause of a given disease and the influence of therapy on that disease. In these considerations, our limitations will be so forcibly emphasized that the intern and junior members of the staff will constantly have the stimulation of critical clinical analysis, leading to the development of the scientific spirit. This is termed the consideration of living pathologic conditions.

The foregoing procedure devised for the training of interns places a definite teaching responsibility on the chief of each service. It tends to assure the mastery of at least fundamental technics and procedures. It places responsibility on a definite member of each staff, who is accountable to the chief, for intern instruction. It endeavors to give the intern a comprehensive view of an entire case, tending to develop a conception of the relative values of the different diagnostic and therapeutic procedures. It furthermore insures a consideration of basic sciences in the determination of the influence of a given pathologic condition on normal physiologic reactions in the production of symptoms and tends to stimulate interest in investigation toward determining the cause and effect of a given pathologic condition.

OUTLINE OF MINIMAL ESSENTIALS

In order that the intern may be assured of mastering the basic principles and important fundamental procedures and technics of each service, a list of minimal essentials should include at least the following:

1. Demonstration of ability to obtain a pertinent and comprehensive case history.
2. Demonstration of ability to make a competent physical examination.
3. Acquirement of competence in special technical procedures (enumerated) and evidence of a comprehension of their use and value.
4. Actual observation and treatment of certain special clinical entities (as outlined).
5. Ability to make a reasonable diagnosis, institute and conduct rational therapy (write prescriptions, apply splints, perform venipuncture, and so on).
6. Attendance at all postmortems, staff rounds, clinical conferences and prescribed clinics.
7. Submission of required summary histories.

A list of minimal essentials is given to the intern as he is assigned to each service. At the completion of each service the intern instructor sends to the intern committee a copy of the list of minimal essentials of that service, having initialed those subjects which a given intern has mastered, with such criticisms or recommendations as he may wish to make.

INTERN INSTRUCTOR

In the organization of intern training in any department, the appointment of an intern instructor is primarily directed toward the administration of intern instruction in that service. When an intern reports to a service for duty, he reports to the resident and intern instructor, is introduced to the chief and staff personnel, and is instructed in service routine and his special duties. The importance of this formal introduction to the service is obvious. The intern instructor's duties are to observe carefully the intern's work, be his confidant, see that he is assigned to various members of the staff for special training when such is necessary, and keep a record of his achievements so far as the mastery of minimal essentials is concerned. The intern instructor may at first feel that he is being shouldered with a lot of responsibility and nonclinical duties which consume considerable time, perhaps more than he can afford to give. This need not be the case, for, after intern instruction has once been organized, it soon develops into a habit procedure which tends to increase the efficiency of the service, in that the well instructed intern greatly promotes the smooth running of a service and eventually saves more time by enhancing efficiency than is given in actual instruction.

In the appointment of the intern instructor, the chief of the service should exercise judgment in selecting one who is thoroughly competent to give intern instruction, has the required personality, is interested in teaching, and will

devote the time and energy required. The intern instructor will constantly keep in mind, in his supervision of the intern's instruction, that no endeavor is being made to make a specialist of the intern, but he should assure himself that the intern is really mastering those various arts of the service which would be expected of a well trained general practitioner who will be capable of appreciating his possibilities and his limitations in any special field.

SUMMARY SHEET

The average hospital chart is usually a rather cumbersome affair filled with many routine details. For an intern to obtain a comprehensive view of a given case from beginning to end, a summary sheet is advisable. The development of this summary should be progressive with the case, a brief outline of the essential clinical observations leading to a given diagnosis, the indications for the specific therapy employed, the result of this therapy, and the pathologic conclusions. The summary sheet should be used with each staff case so that the attending physician or intern may obtain a comprehensive summary of the case to date by examining a single sheet of the history (referring to the chart proper for details). In making rounds, in the operating room, and in clinical conferences, those specifically recorded facts of the summary sheet are readily available and serve to give a perspective which cannot be obtained in any other manner. The summary sheet compiled by the intern serves the chief of the service and the attending physicians particularly well in estimating the intern's ability to comprehend essential and important details in a given case. While an intern is on each service, he should be required to hand to the chief copies of the summary sheets of a certain number of specified cases which he has personally attended.

CONSIDERATION OF LIVING PATHOLOGIC CONDITIONS

Too often, the pathologic material obtained from autopsies and operating room has been considered as material for the pathologic museum or has simply served to affirm, or disprove, a given diagnosis. Hence, from a standpoint of instruction, we have termed our clinical pathology as "living pathology," in contradistinction to its purely laboratory consideration, endeavoring to emphasize the effect of a living and developing pathologic condition within the organism as a disturbing factor in normal physiologic functions and to consider symptoms as abnormal physiologic reactions. Instead of simply recognizing symptom complexes and clinical signs, one should interpret them in relation to the disturbance caused by a definite pathologic entity, endeavoring always to stimulate a pathologic consciousness, by asking the question "Why did this pathologic condition produce certain symptomatic effects and what caused the original development of the pathologic condition?" A consideration of pathology in this way directs constant attention to basic sciences on which the whole structure of medicine rests.

GENERAL CONSIDERATIONS

Certain requirements are obvious in intern training, such as library facilities, opportunity for reading, proper allotment of time and service assignments, defining of responsibilities, and limitation of procedures, which involve organization in preparation for satisfactory intern service and instruction. The general administration, as well as the staff, of an institution should appreciate the obligation of intern instruction and its value in promoting efficiency in the various services. The four principles introduced herein as a basis for organizing intern instruction were developed in the effort to assure the intern and resident a more complete mastery of those basic principles and artful technics which underlie the practical application of medical knowledge.

These principles were adopted in the organization of intern and resident training of the Flower-Fifth Avenue Hospital, connected with the New York Medical College, New York City.

Overdoses of Technological Training

The medical student and the doctor, too, are in danger of overdoses of technological training and becoming surfeited by undiluted medicine. These studies might profitably be sweetened by the introduction of studies which broaden the views from the narrow picture of disease to the larger scenes of all society. The quality of the doctors would be improved by adding social thinking to their training; the physician might acquire a special medical culture which would impress him with a new conception of medicine as an art and give him a greater concern for the doctor's relationship to humanity. European universities have carried this branch of teaching further than we have. As far back as 425 B. C., Hippocrates wrote a book entitled "Ancient Medicine" in which he discussed doctors and medicine of former times. He said that a physician must know what physicians before him have known; if he did not, he would deceive himself and others. Medical history acquires its best value only as it is converted into medical sociology. This is the atmosphere in which good physicians are bred. Knowledge, because of its commercial uses, is apt to be given a greater value than reasoning, but education is, after all, best concerned with the emphasis on thinking.—Black, B. W.: Community Aspects of Medicine, *J. A. Am. M. Coll.* 13:19 (Jan.) 1938.

Comments and Reviews

ON ENTERING MEDICINE

Many of you, now, are at the threshold of the goal which you have been seeking for many years. The thought may come to some that now that they have reached this pinnacle, the only requisite is barely to satisfy the minimum standards in order to achieve the final award of the doctorate in medicine. An aim of this stature is not adequate. The study and the practice of medicine form one of the most highly specialized professions, with standards of attainment and ethics unequaled in any other profession. The attainment of these standards by those who have gone on before us has not been simple but an unselfish task of grand labors. Thus it behooves us to emulate these pioneers and carry our profession forward. This is, also, an unstinting task, one in which only intelligent, far-seeing planning and accomplishment will promise success.

The technical aspect of medicine increases year by year to the student's consternation, but this is one of the reasons that you have been chosen so carefully. You have, however, the advantage of highly trained, sympathetic instructors to guide you along the path of the science. The art of medicine will be revealed to you in your clinical experiences, but your grasp in this field is a personal problem. Your ability to handle yourself is of supreme importance in the practice of medicine and that has been a major factor in choosing you, a member of the freshman class.

Remember as you consider your lot that medical practice has a long history of leadership and always has been an important influence in the shaping of civilization. This is even more true today than ever before. Constantly look around you, delve, and discover the problems of medicine. You have a glorious heritage. Do not confine yourself entirely to the purely technical aspects. Widen your horizon, broaden the base of your cultural background so that our profession may continue to lead society.

Your entrance into the study of medicine is the beginning of a responsibility and not an end of safe security or intellectual aristocracy. The horizon of medicine is boundless and our knowledge is paltry, in spite of the tremendous amount of truths that have been accumulated and will be passed on to you for mastery. Thus, your course must be broad and unswerving, never losing the concept of the technical and social problems of the profession of medicine in society.

To be a good doctor, one must above all be a gentleman. Within our own buildings, misconduct is laid directly at our door; in the hospitals it is laid first at the door of the medical school. That we are allowed to be present in the wards of the hospitals is a distinct honor and privilege. That privilege must be treated with care lest our welcome be spoiled. The student must be considerate of those about him, particularly patients with whom he comes in contact.

Abridged Foreword from the Handbook of Wayne University College of Medicine, 1938-1939.

SCHICK REACTIONS IN MEDICAL STUDENTS

During the seven years ending with 1936, each sophomore student at St. Louis University School of Medicine was Schick tested. The majority of the 816 students were between 22 and 27 years of age. Pulley and Fleisher,[1] in making a special study of this group, learned that 72.2 per cent of the sophomores had no history of diphtheria or of immunization; 11.7 per cent gave a history of diphtheria; 10.5 per cent reported active immunization with no history of diphtheria, while 5.4 per cent had been passively immunized. The writers divided the total group of students into subgroups according to their previous place of residence. There were four subgroups including (1) those who resided continuously in a larger community, (2) those who resided continuously in a smaller community, (3) those who were born in a larger and later moved to a smaller community and (4) those who were born in a smaller and later moved to a larger community. A city of less than 50,000 was classed as small. When the data were tabulated, it was found that the percentage of negative Schick reactions decreased in students passing from residence in larger communities to residence in smaller communities.

There was a sharp drop in Schick negative reactions they said in students who resided for some part of their lives in a larger community. This material suggests that even among those exposed to active immunization the likelihood of developing a negative Schick reaction is greater with continuous residence in the larger communities. The Schick negative students were slightly more common among those who had lived permanently in larger communities than among those who had spent a portion of their lives in small communities, and considerably more frequent among those who resided constantly in smaller communities. The authors caution against drawing definite conclusions from these relatively small groups. However, they suggest, as others have, the relative importance of residence in a larger community in the development of natural immunity to diphtheria.

1. Pulley, H. C., and Fleisher, M. S.: Schick Reactions in Students of Medicine, Am. J. Pub. Health 28:854 (July) 1938.

The Schick negative students comprised 64.5 per cent of the entire group, which is lower than might be expected; somewhat low also was the 76.4 per cent of Schick negative tests among those who had been exposed to active immunization.

The authors consider that the most striking tendency which appeared in this study was a gradual diminution during the seven year period of Schick negative reactions among those who gave no history of exposure to active immunity. The factor of residence was not considered responsible for this change. It is more likely due, they say, to lack of exposure to subclinical contact with diphtheria bacilli. This raises an interesting question in relation to the control of diphtheria, since it is assumed that the development of immunity in persons nonactively immunized is related to contact with the causative agent. If active immunization tends to reduce the opportunities for contact with diphtheria bacilli, then those persons who have not been actively immunized must be especially guarded, or the immunization campaigns must be carried on with vigor in order to cover as nearly 100 per cent of persons as possible.

THE MEDICAL CURRICULUM AND PRESENT-DAY NEEDS

Sir Walter Langdon-Brown has been a member of three committees, each one designed to improve and lighten the medical curriculum, but the results of the lengthy deliberations, he says, were not impressive. Every one on the committee agreed that the curriculum ought to be lightened, but each thought that the other man's subject could be cut down while more attention should be given to his own. The anatomists were steadfast, unmovable, always abounding in the faith that dissection of the whole body is necessary unto salvation. Many nonanatomists do not think so. When men say that after demonstrating anatomy for ten years or so they rapidly forget the finer details and remember only what is of practical importance to their surgery, then how much anatomic detail can one expect the average student to remember? In his time, the author said, they were taught almost as much error as truth so far as the viscera were concerned. Today the student sees on the screen the stomach as it is in life and activity; he learns its variability within the limits of normal. He sees the skeleton living and moving on the fluorescent screen. But is it fair to expect the student to carry the whole weight of the old anatomy in addition to the new?

Abstract of a paper by Sir Walter Langdon-Brown, Emeritus Professor of Physics, University of Cambridge, England, published in the Educational Number of the British Medical Journal, Sept. 3, 1938.

Physiology has become almost as abstract as physics, and a survey of examination results suggests that in some schools the teaching of it has departed from the lines suitable for the training of those designed to become doctors and not whole-time physiologists. If this is so, it is to be regretted, for there is no sounder foundation for medicine than physiology.

Materia medica has been cut down almost to the vanishing point in most curriculums, and rightly so. Now that the old type of apothecary has disappeared, doctors do not handle the raw material from which medicines are made, and the time formerly occupied in learning about them can be more profitably employed. As to the teaching of pharmacology, this has largely come under the aegis of the physiologist, who has in turn handed over histology to the anatomist. The author is strongly in favor of the examination in this subject being conducted by pharmacologists and clinicians working in pairs. In this way its practical therapeutic aspect is kept to the fore.

Observations in the Wards

It is alleged that the student today relies too much on what he is told rather than on what he can observe for himself. For this the examination system is somewhat to blame. Nothing can take the place of living in the wards as much as possible and observing closely the progress of actual cases.

It is a special advantage of our English plan of clinical clerkship that the student is taught to regard a certain number of the ward inmates as his patients—he is their doctor; the personal individual relation is encouraged from the very beginning, and it is the best introduction to general practice. "I used to make it a point to urge on all my students the prime importance of taking a full history. As time goes on, I have found myself taking more and more time over the history compared with the time occupied by the physical examination." The history tells so much about patients, their general outlook and temperament, and prepares them for the kind of examination specially called for. Remember the enormous difference in the effect on the patient that can be produced by your attitude toward him. Patients are in a state of fear—whether obvious or concealed. They are watching you closely and are much more ready to accept an unfavorable than a favorable suggestion. Keep a straight face when the patient tells you his interpretation of his symptoms, however preposterous it may be. The patient's statements, though demonstrably false, tell a lot about him.

The Psychologic Aspects of Disease

It is highly important that the student be made familiar with the psychologic aspects of patients in hospital, whether they are under

treatment for organic disease or for functional nervous disorders or are admitted merely for observation. With this object, a series of demonstrations should be held at least once a fortnight throughout the student's period of inpatient clerking and inpatient dressing. In every ward there are patients suitable for demonstrations of this kind, but a considerable amount of time is required in some instances for their preliminary study by a psychotherapist before they can be used for the purposes of teaching. In some schools such demonstrations have met with great success. The physician or surgeon in charge of the ward may undertake them or may hand over that duty to a colleague who is attached to the hospital for the purpose of teaching medical psychology.

In the final qualifying examination adequate knowledge of the psychologic aspects of ill health should be expected from the candidates. My experience as a teacher has shown that the pressure to teach the neuroses is coming from below—the students are eager for it, and if they don't get it from one man or in one school they will go elsewhere. In the future no school will be able to maintain its prestige if it persists in neglecting its opportunities in this direction. In this way, a man going into practice would not have the humiliating experience of finding himself confronted with conditions that he had never encountered in textbooks. Having allowed for or excluded organic factors, he would know how to look for the psychic causes at work. Above all, we must not overwhelm the student with a mass of facts at the expense of developing his powers of observation and deduction. With those powers, he will be able to go on educating himself.

The Examinations

The plan instituted in the National University of Ireland by Prof. Henry Moore at Dublin is the best I have met with. It necessitates three pairs of examiners. The candidates have an hour to examine and write up their first case; they are then put on to a second case, which they go over in the presence of two examiners, pass on to a "spot" case with two more, and are finally cross-questioned on their first by the examiners who have had an opportunity of reading the scripts. The examiners deal with the same cases; it is the candidates who change over. As no candidate should pass who fails to obtain half marks in the clinical examination, it is wise that such a decision should depend on the judgment of more than one pair of examiners. Most examiners of experience are confident that they can judge a candidate's capacity better by oral than by written examination. This is true if the candidate remains in a normal state of mind; unfortunately some of them seem to become disoriented and aphasic under the ordeal. Every effort should be made not to keep candidates locked up and waiting for a long time; for fear is infectious under such conditions.

The Candidates

The examiners have all been candidates themselves and know both the difficulties experienced and the devices adopted. Do not imagine they are out to trap you. Map out your time for the different questions in the papers. It is not easy to gain many extra marks by a specially long answer, while to omit a whole question for lack of time seriously reduces your total. It is easy, on the other hand, to get from 25 to 30 per cent of the marks by giving a synopsis of an answer if you have not allowed yourself time to answer it fully. Don't give rare causes first; it only proves you lack a sense of proportion. If at the oral you do not know the answer to a question, say so—do not waste time which should be devoted to gaining more marks by glaring helplessly at the examiner. You will get more credit for routine examination of the patient and good observation than for a lucky shot at the diagnosis. Put clinical points first. If asked what is the first thing to do when called to see a case of jaundice, do not reply, "I would do a van den Bergh," or that the first thing you would do for hematemesis is to give a barium meal. You would do nothing of the sort. The attitude of clinical teachers may do something to contribute to developing this absurd state of mind. The student is influenced more by what he sees his teacher do than by what is said, and he is quick to notice that the newer methods interest the teacher most.

"Let me welcome recruits for the study of the most fascinating, if one of the most exasperating, professions. Its combination of scientific and human interest will provide the satisfying feeling that a life spent in its pursuit has not been lived in vain."

WOMEN IN MEDICINE

"The most important requisite for any one wishing to study medicine is the possession of a clear objective, a desire for the work so definite that all other things fade in importance, for medicine is a jealous mistress. Presupposing determination and a general aptitude for the work, the next most important factors are health, personality and money." Thus the *International Altrusan* tells in a recent issue what the prospective medical student may expect and must have.

Women are especially well suited to practice medicine if they are intelligent enough to practice sanely and scientifically, instead of emotionally. Women, scientifically trained, emotionally stable, can be and are among our best obstetricians. Not strength but wisdom and good judgment are needed.

Women in medicine should not try to overcome their feminine tendencies, the article

declares; as women they have special contributions to make. They should prize their intuitive powers and should remain and work as women. Being oneself leads to more success than imitating others.

Prof. Arthur Curtis of the University of Michigan says that the average educational standard of women entering medical school is higher than that of men. A smaller percentage of women who enter medical school fail than men. However, there are not as many women studying medicine now as there were twenty-five years ago. This is probably due to the other fields that have been opened up to them.

Although not many women have entered the field of surgery, women do make good surgeons and are increasing in number as opportunities for postgraduate study are available to them in the many specialized branches.

THE BRITISH EDUCATIONAL NUMBER

The British Medical Association publishes annually an educational number of the *British Medical Journal* in order to inform students and their parents of what must be done to become a registered medical practitioner and to help those who desire to know what a medical career has to offer. In a general article entitled "The Profession of Medicine," the cost of medical education, the choice of a career, general practice, consulting practice and professional organization are considered. There is an account of the training required of students, the places where it can be obtained and the organizations that confer degrees or diplomas entitling successful candidates to become legally qualified medical practitioners.

It is advised generally that any one who thinks of entering the profession should be prepared for an outlay of at least 1,500 pounds, since their professional education must continue for five years. Something more than two thirds of this total would probably be spent on maintenance, and the rest in tuition, fees for examinations and admission to degrees or diplomas. For those who live in rooms away from home, 120 pounds per annum for board, lodging and the like is considered a minimum figure. There are, however, many ways for students to reduce the expense at most of the medical schools in the way of scholarships and money prizes offered. The General Medical Council has issued for the guidance of students a memorandum which gives information about the comparative cost of study and examinations at the various medical schools.

The Number of Doctors

The Medical Register is the official list of legally qualified medical practitioners kept by the General Medical Council. The total number on this list Dec. 31, 1937, was 60,163, of whom 2,214 had been added in the last year. The number of practitioners was 20,350 more than it was thirty years ago. The population of the British Isles has not increased at anything like that rate, and the ratio of doctors to inhabitants is much higher now than it was formerly. It is safe to say, the *British Medical Journal* adds, that at present there are quite enough doctors to satisfy present demands; on the other hand, the regius professor of medicine at Oxford has publicly expressed the opinion that the profession is far from being overcrowded. His opinion apparently is based on the belief that the work of doctors in the future will be somewhat different from what it has been in the past and will be that of preserving health and preventing disease. Some 10 per cent of the total number of registered practitioners in the British Isles today are women. According to returns published by the University Grants Committee, women constituted 16.1 per cent of the total full time students of medicine and dentistry in England, Scotland and Wales in the academic year 1936-1937.

The British Medical Association has stated as an axiom that medical service of the community must be based on the provision for every individual of a general practitioner or family doctor. Some twenty-five years ago medical practice in the British Isles saw a radical change in the institution of a national system of compulsory health insurance. The insurance system, the *British Medical Journal* says, has induced a better class of men to enter the profession, by raising the standard of living among doctors. The Insurance Acts provide domiciliary medical attendance for about nineteen million persons, and more than 19,000 doctors undertake the medical care of this vast part of the community. By placing their names on the panel list, these practitioners agree to comply with the terms of the service set out in the Medical Benefit Regulations and other relevant provisions.

Consulting Practice

Success as a consultant or specialist is hard to achieve in the British Isles, except by the aid of appointments to hospitals, particularly those with medical schools, and the time to wait for appointment to these much sought after positions usually is long. In the larger industrial towns of the North of England, there are many "general practitioner specialists" who combine panel practice with surgical or other special work in well equipped hospitals which admit patients in different categories according to their means. In securing election to the visiting staff of the large hospital, additional degrees and diplomas are important factors and a considerable number of those who have graduated as M.B. from a medical school, including many general practitioners, proceed later to attain the M.D. There are in England three medical cor-

porations which grant licenses to practice, the Royal College of Physicians of London, the Royal College of Surgeons of England, and the Society of Apothecaries of London.

The General Medical Council

The conditions with which those who wish to enter the medical profession must comply are regulated by the General Medical Council, which is a statutory body established by law in 1858. The duties of the council are (1) to keep the Medical Register; (2) to see that no person is listed in the Register as qualified unless he has had an adequate education and to remove from the Register the names of qualified persons who are no longer entitled to pubic confidence, and (3) to provide for the publication of the British Pharmacopeia. It is the entry of a name on the Medical Register and not the possession of a diploma or degree that constitutes a person as a legally qualified practitioner of medicine. The General Medical Council has thirty-nine members, eighteen of whom are appointed by the universities of the United Kingdom having medical faculties; nine by the medical corporations, such as the Royal College of Physicians and Surgeons; five by His Majesty in Council, and seven are elected by members of the profession as a whole; to these are added three dentists who are members of the Dental Board. Although twenty-three of the thirty-nine members may be laymen, only two laymen have ever been appointed, and both of these were members of His Majesty's Privy Council.

There are eleven universities in England and Wales, all having fully developed medical faculties; four universities in Scotland (St. Andrews, Glasgow, Aberdeen and Edinburgh), and three universities in Ireland (the University of Dublin, the National University of Ireland and Queen's University of Belfast), each with a medical faculty. There is given a brief account of all the universities.

Graduate Study

The facilities for graduate study include the British Postgraduate Medical School, which is a part of the University of London and is associated with the 534 bed Hammersmith Hospital. The school provides refresher courses of an intensive character for general practitioners, but the most important part of the tuition, it is said, is the instruction provided for medical graduates from all parts of the world who desire to extend their knowledge in medicine or surgery, or midwifery, and for students of pathology who desire to do advanced work. Among other facilities for graduate work are the North East London Postgraduate College, the Radium Institute and Mount Vernon Hospital, the West End Hospital for Nervous Diseases, the Fellowship of Medicine and Postgraduate Medical Association, and the facilities for graduate study in Manchester, Bristol, New Castle, Cardiff, Edinburgh and Glasgow.

An important development in graduate study facilities took place during the last year, whereby an arrangement was made with the ministry of health to afford graduate facilities for some insurance practitioners, including for 1938 about 800 places in England, 100 in Wales, and 250 in Scotland. The conditions to obtain a grant for a practitioner to attend such a course are: (1) that he has not less than 300, or in rural practice 150, insured persons on his list, (2) that five years has elapsed since the date of his first registrable qualification, (3) that no grant will be made to a practitioner more than once in five years. A grant for the course covers (1) the fee but not exceeding 5 guineas unless specially authorized, (2) traveling expenses, (3) subsistence not exceeding £5 a week if the practitioner sleeps away from home, or £1 in other cases, (4) not exceeding 8 guineas a week where necessary, for a whole-time locum tenent. During the first year of this arrangement there were about three times as many applicants as there were places available.

Other sections in the educational number intended to help students comprise discussions of the Royal Navy Medical Service, the Royal Army Corps, the Medical Branch of the Royal Air Force, the Indian Medical Service, the Prison Medical Service, the Colonial Medical Service, the Sudan Medical Service, facilities for the study of tropical medicine and psychological medicine, and finally a brief description of the British Medical Association, with a picture of its building at Tavistock Square, London, W. C. 1, England.

APPENDICITIS IN COLLEGE STUDENTS

Schmidt and Joachim[1] report a study of appendicitis as observed in the Student Health Department at the University of Wisconsin from 1928 to 1937, including 615 admissions to the University Infirmary for appendicitis. The patients were healthy, intelligent young adults who came to the infirmary within a few hours after the onset of their symptoms. Very few of them had resorted to self medication. There is an advantage in treating a select group of young adults under such desirable conditions, and that was responsible at least in part for the mortality rate, which was 0 in this group of students.

The good results have been reported in the management of appendicitis by student health departments elsewhere. The average age of these patients was 20 years, and 75 per cent of them were seen at the infirmary before their

1. Schmidt, E. R., and Joachim, F. G.: The Student Health Problem of Appendicitis, Journal-Lancet 58: 329 (July) 1938.

symptoms were twenty-four hours old. The advantage of early hospitalization is again shown in their unusual freedom from complications. The appendix was ruptured in only twelve cases. Half of the patients with a perforated appendix were operated on and the other half were treated conservatively. Peritonitis was localized in all the cases but one in which the appendix was perforated, and that case responded well to conservative treatment.

Schmidt and his associates treated about an equal number of patients with appendicitis at the State of Wisconsin General Hospital proper, which is adjacent to and in fact connected with the Student Infirmary. The personnel who cared for these two groups of appendicitis patients was identical. Comparison of the two groups shows that whereas the students' ages ranged from 18 to 21 years, one third of the group of patients from the State of Wisconsin General Hospital were either under 10 years of age or over 30. Only 45 per cent of the patients in the State of Wisconsin General Hospital were admitted on the first day of illness, as contrasted to 75 per cent in the Student Infirmary group. Furthermore, 20 per cent of the hospital patients had taken a cathartic prior to admission. The appendix had ruptured in 19 per cent of the hospital patients as contrasted with only 2 per cent in the student group. The gross mortality of the State of Wisconsin General Hospital group was 5.68 per cent and that of the student group, 0.

This comparative study seems to show that success in the treatment of appendicitis depends on the age of the patien., the duration of the illness and the matter of self medication. The conditions attending the treatment of acute appendicitis in a student health practice are optimal.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Vacancies for Interns

There are now vacancies for second year medical interns in the United States Public Health Service, particularly at government hospitals located at Lexington, Ky., and Fort Worth, Texas, and some of the federal penal and correctional institutions. Detailed information may be obtained by writing to the Surgeon General, United States Public Health Service, Washington, D. C., or to Dr. Fletcher C. Stewart, medical officer in charge, U. S. Marine Hospital, Evansville, Ind.

National Research Council Fellowships Available

The National Research Council announces that fellowships in the medical sciences will be available for the year beginning July 1, 1939, open to citizens of the United States and Canada with M.D. or Ph.D. degrees. They are intended for recent graduates and not for persons already professionally established. Appointments will be about March 1, 1939, and applications must be filed on or before January 1. For further particulars concerning these fellowships, address the secretary of the Medical Fellowship Board, National Research Council, 2101 Constitution Avenue, Washington, D. C.

Ward Rounds for Students

In response to a request from the University of Rochester School of Medicine, the Medical Board of the Rochester General Hospital recommended that the hospital cooperate with the university by permitting small groups of students to make rounds in the wards with the visiting staff. On September 27 six members of the third year class in surgery, and on October 1 nine members of the third year class in obstetrics made ward rounds. At the meeting of the medical board of the hospital September 16 Dr. James K. Quigley was elected chairman, Dr. Edward T. Wentworth vice chairman and Dr. Leslie R. Lingeman secretary-treasurer.

Gift for Research in Tuberculosis

The trustees of the Albany Medical College announced the receipt of a $100,000 trust fund for research in tuberculosis and pharmacology from the estate of the late Dr. Howard Van Rensselaer, professor of therapeutics at the college for many years. Under the terms of the will, Dr. Van Rensselaer, who died in March 1925, left half of his estate, after payment of certain legacies, in trust to his sister-in-law Mrs. William Bayard Van Rensselaer. On her death the trust fund was left to Union University, the income to be expended under the direction of the Albany Medical College for research in tuberculosis and pharmacology.

Faculty Changes at Jefferson Medical College

At the formal opening of the Jefferson Medical College, Philadelphia, September 20, the following appointments to the faculty were announced:

Dr. Bernard J. Alpers, assistant professor of neurology, at the graduate school of medicine, University of Pennsylvania, has been appointed to the chair of neurology.

Dr. Henry R. Mohler, the new dean, succeeding the late Dean Ross V. Patterson, will also be the Sutherland M. Prevost professor of therapeutics.

Dr. James Torrance Rugh has consented to amend his resignation so that it will take effect only when a suitable successor can be obtained to fill the James Edwards chair of orthopedic surgery.

This year's freshman class of 143 students was selected from about 650 applicants. Thirty-one members of the new class of students are either the sons or other near relatives of physicians.

Arthritis Research Unit at Michigan

The recently established Rackham Arthritis Research Unit at the University of Michigan already has under way a program of investigation. At present the studies are confined to cases of active rheumatoid arthritis, gonorrheal arthritis, psoriatic arthritis and gout, the clinical studies being on patients referred from other university clinics, and include a complete physical

examination, a thorough study of the patient's history, laboratory studies and carefully controlled treatment. Biochemical investigations which have a direct clinical application and bacteriologic and immunologic studies are being made. The staff of the Rackham Arthritis Research Unit at present comprises Drs. Richard H. Freyberg and Charley J. Smyth; biochemist, W. D. Block; bacteriologist, W. S. Preston, and Miss M. E. Bishop, laboratory assistant. It is expected that other laboratory assistants and a nurse will be added to the staff in the near future.

Michigan Personals

Dr. Ferdinand Gaensbauer has returned to Ann Arbor and is again serving as instructor in the department of obstetrics and gynecology at the University of Michigan Medical School.——Dr. Ward W. Woods, assistant resident in surgery at the University Hospital in Ann Arbor, has accepted a fellowship in neurosurgery at the National Hospital for the Paralyzed and Epileptic, Queen Square, London, England.——Dr. Herbert C. Maier, instructor in thoracic surgery, University Hospital, Ann Arbor, has returned to New York City, where he will be resident in thoracic surgery at Bellevue Hospital.

Tufts Awards Commonwealth Fund Scholarships

The Tufts College Medical School, Boston, has awarded the Commonwealth Fund Scholarships for the class of 1942 to Willard H. Boynton of Groveland, Mass.; Alfred G. Chandler of Candia, N. H.; John B. Madigan of Houlton, Me., and John R. Williams of Fair Haven, Vt. The scholarships are $1,000 a year for four years, and the recipients must agree to practice medicine in a rural community of Massachusetts for three years. They must also complete a rotating type of internship in approved hospitals for a period of two years before beginning actual practice.

New Faculty Members at Oklahoma

Donald B. McMullen, D.Sc., professor and head of the department of biology, Monmouth (Ill.) College, has been appointed professor of bacteriology at the University of Oklahoma School of Medicine, Oklahoma City. Rudolph F. Nunnemacher, A.M., Harvard University, Cambridge, has been appointed instructor in histology and the following have been made assistants in medicine: Drs. Allen G. Gibbs, Vern H. Musick and Ralph A. Smith. Dr. Hubert E. Doudna has been appointed lecturer in anesthesia and head of the department of anesthesia in the University and Crippled Children's hospitals.

Award of Foundation Prize

Dr. Wallace E. Herrell of the Mayo Foundation, Rochester, Minn., has received the first award of the Foundation Prize of the Association of Obstetricians, Gynecologists and Abdominal Surgeons. His paper, entitled "Studies of the Endometrium in Association with the Normal Menstrual Cycle, with Ovarian Dysfunctions and with Cancer of the Uterus," was presented September 24 at the fifty-first meeting of the society at White Sulphur Springs, W. Va.

Tennessee Personal

Dr. Henry Packer, director of the Carter County health department, Elizabethton, for several months, has been appointed associate professor of preventive medicine at the University of Tennessee College of Medicine, Memphis, newspapers report. Dr. Packer was graduated from McGill University Faculty of Medicine, Montreal, Canada, in 1933 and later took the degree of doctor of public health at Yale University, New Haven, Conn. He was formerly assistant director of the Gibson County health unit.

Faculty Changes at Woman's College

Dr. Lida Stewart Cogill has retired as professor of obstetrics at the Woman's Medical College of Pennsylvania and has been succeeded by Dr. Ann Gray Taylor. Dr. Henry D. Jump, professor of applied therapeutics, has also retired and Dr. Frieda Baumann has been appointed to succeed him. The following promotions have been announced:

Dr. Ruth N. Miller, associate professor of anatomy.
Dr. Jean Crumpe, associate professor of pediatrics.
Alice O. Carwen, Ph.D., associate professor of anatomy.
Vern V. Cole, Ph.D., associate professor of pharmacology.
Dr. Elizabeth S. Waugh, assistant clinical professor of obstetrics.
Ruth E. Miller, Ph.D., assistant professor of bacteriology.
Dr. F. Marion Williams, associate in clinical psychology.
Dr. Laura E. McClure, associate in clinical pediatrics.
Dr. James A. Lehman, associate in clinical surgery.
Dr. Yetta E. Deitch, associate in clinical dermatology.

Dr. Dorothy D. Miller has been appointed instructor in clinical obstetrics; Dr. Carmen C. Thomas, instructor in clinical dermatology, and Vivian Gould Behrmann, M.S., instructor in physiologic chemistry.

At the opening of the 89th year of the Woman's Medical College of Pennsylvania, September 21, the president, Dr. Chevalier Jackson, presided, and the students were addressed by Dr. Earl D. Bond, professor of psychiatry, University of Pennsylvania School of Medicine.

Gifts to New York University

Cash and bequests amounting to more than $200,000 have recently been made to New York University. Among those to be applied to medical work are the following:

Mr. Bernard Baruch and family, $10,000; Metropolitan Life Insurance Company, $1,562; Lederle Laboratories, Inc., $1,500; Mrs. Cornelius Crane, $500; other donors, $1,000.50 for research in pneumonia under Dr. Jesse G. M. Bullowa.

Felix M. and Frieda Schiff Warburg Foundation, $5,000 and sundry donors, $7,342 for the John Wyckoff Memorial Fellowship Fund.

Committee for the Study of Suicide, $8,000 for the study of suicide at Bellevue Hospital under Dr. Karl M. Bowman.

International Cancer Research Foundation, $3,000 for research in cancer under the direction of Prof. Robert Chambers.

Phi Delta Epsilon Fraternity, $1,500 for the John Wyckoff Lectureship fund.

Winthrop Chemical Company, $1,500 to establish the Winthrop Chemical Diagnostic Fund under the direction of Dr. Arthur C. DeGraff.

Josiah Macy Jr. Foundation, $1,500 for work in pharmacology under Dr. George B. Wallace.

Friedsam Foundation, $1,500 for research in urology under Dr. Meredith F. Campbell.

National Committee on Maternal Health, $1,185 for the Robert L. Dickinson Research Fellowship Fund.

South Carolina Personal

Dr. Thomas M. Peery, formerly with the Medical College of the State of South Carolina at Charleston, recently accepted a position in the Department of Pathology of George Washington University School of Medicine, Washington, D. C.

Dr. Whitacre Accepts Post in China

Dr. Frank E. Whitacre, assistant professor of obstetrics and gynecology at the University of Chicago and instructor for the postgraduate program of obstetrics in Tennessee for the past two years, has accepted an appointment with the Rockefeller Foundation to become head of the department of obstetrics and gynecology at Peiping Union Medical College, Peiping, China. Dr. Whitacre will sail for China immediately following the completion of his contract with the Tennessee State Medical Association, which ends December 1.

The Oldest Medical School Building

The college building at the University of Maryland School of Medicine, at Lombard and Greene streets, Baltimore, is said to be the oldest structure in America devoted to medical teaching. According to the Bulletin of the School of Medicine, University of Maryland, in this building was founded the first medical college library in the United States. Here also dissecting was made a compulsory part of the curriculum for the first time in America. The school of medicine at the University of Maryland was chartered in 1808 and ranks fifth in the point of age among the medical colleges in the United States. It was one of the first to provide for adequate clinical instruction by erecting in 1823 its own hospital, and in this hospital intramural residency for the senior student was first established. In 1934 a new university hospital was opened, with a capacity of about 400 beds, of which about 270 are available for teaching. A new building to house most of the preclinical branches will be ready for occupancy at the beginning of the 1939 fall session.

Appointments at Marquette University School of Medicine

The following new appointments have been made to the faculty of Marquette University School of Medicine, Milwaukee:

Dr. Roland S. Cron, clinical professor and director of the department of obstetrics and gynecology.
Dr. Henry O. McMahon, clinical professor and director of the department of pediatrics.
Dr. Albert H. Lahmann, assistant clinical professor of obstetrics and gynecology.
Dr. Raymond A. Hershberg, supervisor of students at the Milwaukee County General Hospital.
Dr. John Kenneth Karr, clinical instructor in medicine.
Dr. Valorus F. Lang, clinical instructor in medicine.
Dr. James P. Conway, clinical instructor in medicine.
Dr. Elwood W. Mason, clinical instructor in medicine.
Dr. Joseph J. Furlong, clinical instructor in medicine.
Dr. John L. Yates, research associate in oncology.

Since the opening of the fall term, two convocations of faculty and students have been held. At the September 26 convocation Dr. Rock Sleyster, Wauwatosa, President-Elect of the American Medical Association and a member of the board of trustees of Marquette University School of Medicine, was chairman, and Dr. Albert E. Rector, Appleton, president of the State Medical Society of Wisconsin, spoke on "The Present and Future Status of Medical Practice." At the October 8 convocation Dr. Herbert M. Evans, Berkeley, director of the Institute of Experimental Biology, University of California, spoke on "Gonadotropic Hormones—A Comparison of Those Found in the Anterior Hypophysis, in the Urine of Pregnant Women, and in the Blood Stream of Pregnant Mares."

Indiana Personals

Dr. Wendell C. Kelly, Indianapolis, assumed his duties as chief of the Bureau of Venereal Disease Control of the Indiana State Board of Health July 1. Dr. Kelly graduated from the Indiana University School of Medicine in 1936.——Robert E. Lyons, Ph.D., has resigned as head of the Indiana University chemistry department after forty-nine years of service. Herman T. Briscoe, Ph.D., a member of the chemistry department faculty since 1922, will succeed Dr. Lyons.

Medical Licensure Limited to Citizens

The West Virginia Public Health Council recently adopted a resolution limiting the license to practice medicine and surgery in the state to native born citizens and those who have acquired full citizenship. Each native born citizen is to submit a birth certificate and each foreign born applicant a photostatic copy of his naturalization papers. At the same meeting the council adopted a resolution declaring that graduates of unclassified medical schools will not henceforth be considered for licensure either by examination or by reciprocity.

Illinois Personal

Dr. Haskel Maier, formerly an intern in the department of otolaryngology at the University Hospital, Ann Arbor, Mich., has accepted a residency in the Ear, Nose and Throat Department at Michael Reese Hospital, Chicago.

Appointments at the University of Texas

Among the new appointments at the University of Texas School of Medicine announced are Warren C. Woelfel, M.S., instructor in biologic chemistry; Dr. George M. Decherd Jr., formerly at Louisiana State University, to be associate professor in the practice of medicine; Drs. Ernest A. Maxwell and William D. Seybold to be instructors in anatomy; Dr. James O. Chambers to be instructor in pathology.

Grant for Research in Biochemistry at Pittsburgh

The Buhl Foundation grant for research in biochemistry has been renewed for the college year 1938-1939 for studies on vitamin C, tissue respiration and molecular structure in the department of chemistry of the University of Pittsburgh. The following research fellows were appointed under the renewed grant: Max O. Schultze, Ph.D., Wisconsin, animal nutrition and tissue respiration; Rade R. Musulin, Ph.D., Pittsburgh, animal nutrition, and Herbert E. Longenecker, Ph.D., Pennsylvania State College, the molecular structure of fats. Charles Glen King, Ph.D., professor of chemistry, is director of the general project.

Changes in Personnel at Stanford

The following new appointments and other changes in personnel in the department of pharmacology, Stanford University School of Medicine, San Francisco, have been announced:

Dr. Windsor C. Cutting, as assistant professor of therapeutics, full time; formerly fellow of the National Research Council for one year at the Courtauld Institute of Biochemistry, London, and for two years fellow in experimental therapeutics and medicine, Johns Hopkins University School of Medicine, Baltimore.
Dr. Arthur P. Richardson, instructor in pharmacology, as fellow of the National Research Council for one year at the department of pharmacology, Johns Hopkins University School of Medicine, Baltimore.
Walton Van Winkle Jr., assistant in research and instruction, as instructor in pharmacology.
Mrs. Nancy Kidd Kennedy, formerly research assistant in pharmacology, Yale University, and Mr. M. C. Merten (A.B., Stanford) as assistants in research.
Dr. Anthony E. Ambrose, assistant in research, and junior pharmacologist, pharmacology research unit, U. S. Department of Agriculture, as assistant professor of pharmacology, University of Louisville School of Medicine, Louisville.
Dr. Arnold J. Lehman, research associate during the summer quarter, 1938, at Stanford, and assistant professor of pharmacology, University of Oklahoma School of Medicine, Oklahoma City, as associate professor of pharmacology, George Washington University School of Medicine, Washington, D. C., beginning the second semester 1938.

Kentucky Personal

Alfred W. Homberger, Ph.D., head of the department of chemistry at the University of Louisville, was given a testimonial dinner sponsored by the Chemistry Club Alumni Association, in recognition of his twenty years service to the university. Dr. Aura J. Miller, professor and head of the department of pathology and serology of the School of Medicine, was master of ceremonies. A silver tray with "H_2O" engraved on it was presented to Dr. Homberger.

Changes at Medical College of Virginia

Faculty promotions at the Medical College of Virginia, Richmond, were recently announced as follows:

Dr. Stuart N. Michaux, professor of gynecology.
Dr. Robert H. Courtney, professor of ophthalmology.
Dr. Robert Finley Gayle Jr., professor of neuropsychiatry.
Dr. Thomas W. Murrell, professor of dermatology and syphilology.
Dr. Lee E. Sutton Jr., professor of pediatrics.
Dr. William D. Sugga, assistant professor of gynecology.

New appointments include that of Dr. Joseph F. Geisinger, Richmond, as professor of clinical urology. Dr. Wyndham B. Blanton resigned last session as professor of the history of medicine and has been made associate professor of medicine. The following were made professors emeritus on their retirement July 1:

Dr. St. George Tucker Grinnan, pediatrics.
Dr. Emory Hill, ophthalmology.
Dr. Edward P. McGavock, dermatology and syphilology.
Dr. Charles R. Robins, gynecology.
Dr. Beverley R. Tucker, neuropsychiatry.

Philadelphia Personal

Dr. Charles J. Miller, chief resident physician at Mount Sinai Hospital, has received the Shmookler Memorial Fellowship and will spend a year at the Graduate Hospital of the University of Pennsylvania working in internal medicine.

The Shoemaker Prize for Senior Students

Dr. Jerome Kotieroff, a graduate of the University of Maryland School of Medicine in June, was awarded the Samuel M. Shoemaker prize for the best essay on "Milk in Relation to Public Health." This annual award for senior students was established as a memorial to the late Mr. Shoemaker, for many years president of the board of regents of the University of Maryland, by Mrs. Shoemaker and Mrs. Bartlett F. Johnston. *Baltimore Health News* says that probably no person was more responsible than Mr. Shoemaker for improvements in the sanitary quality of milk supplies in Maryland during his lifetime.

Louisiana Personals

Dr. Edwin Socola has been appointed clinical professor and Dr. Athol Stewart Kenney assistant professor in the department of pediatrics at the Louisiana State University School of Medicine, New Orleans.

Appointment of Dean in the Philippines

Dr. Bonifacio Mencias, Manila, has been appointed dean of the University of Santo Tomas College of Medicine and Surgery, Manila. Dr. Mencias, who graduated from Santo Tomas in 1915, was president of the Manila Medical Society in 1937.

Dr. MacDonald Heads New Orleans Child Guidance Clinic

Dr. Martha MacDonald, who for three years has been in charge of the Children's Division of the Department of Psychiatry at Michael Reese Hospital, has been appointed director of a new child guidance clinic established in New Orleans. This clinic has been made possible through the contribution of Mr. Samuel Zemurray, president of the United Fruit Company. It will be closely associated with the departments of medicine of Tulane and Louisiana State University and promises to fill a long felt need in New Orleans and to provide leadership to this section of the country. Dr. MacDonald graduated from the University of Pittsburgh School of Medicine in 1924.

Prizes Awarded at Albany Medical College

At the 137th commencement of Albany (N. Y.) Medical College, recently, awards and prizes were made as follows: The John Milton Bigelow Prize was awarded to Dr. Donald Langworthy Burdick; the S. Oakley Vander Pool Prize to Dr. Samuel Stanley Dorrance; the first prize under the Daggett Trust was awarded Dr. Donald Rich Lyon and the second prize to Dr. Ethel Gladys Cermak. Members of the freshman class who received prizes were Ethel Burack and Irving Cramer, who were awarded the first and second Daggett Anatomical prizes respectively; Mr. Samuel Kantor of the junior class received the Townsend Physiological Prize.

Maryland Personal

Francis Owen Rice, D.Sc., associate professor of chemistry, has resigned from the faculty of the Johns Hopkins University to become professor of chemistry and head of the department of chemistry of the Catholic University of America, Washington, D. C.

Appointments and Promotions at Wayne University

The following appointments have been announced at the Wayne University College of Medicine, Detroit:

Dr. Edgar H. Norris, professor of pathology.
Hans O. Haterius, Ph.D., associate professor of physiology.
Dr. Paul H. Noth, assistant professor of medicine.

Dr. Richard M. Johnson has been promoted from assistant professor of medicine to associate professor of medicine to be in charge of teaching at Eloise Hospital. Dr. Johnson has been appointed medical director of Eloise Hospital.

Fellowships in Psychiatry Awarded

The National Committee for Mental Hygiene announces the following fellowship appointments for one year's training in extramural psychiatry.

Under a grant from the Commonwealth Fund:

Dr. Grace R. McLean of the Pilgrim State Hospital, Brentwood, N. Y., to the Cleveland Child Guidance Clinic.
Dr. John A. Rose, Ithaca, N. Y., Cornell Student Health Service, to the Philadelphia Child Guidance Clinic.
Dr. John Russell of the Osawatomie (Kan.) State Hospital to the Los Angeles Child Guidance Clinic.
Dr. Rex K. Burton of the Iowa State Psychopathic Hospital to the Judge Baker Guidance Center.
Dr. William B. Curtis, now on the Neurological and Neurosurgical Service at Bellevue Hospital, to the Mental Hygiene Clinic at Louisville.

Under local provision:

Dr. William L. Holt Jr. of the Worcester State Hospital to its Child Guidance Clinic.
Dr. Norman Westlund of Traverse City (Mich.) State Hospital to the Children's Center at Detroit.

Advanced Military Course at Georgetown

Georgetown University School of Medicine, Washington, D. C., has established this year an advanced course requiring three years of study for students desiring to be commissioned in the Medical Corps of the United States Army. Lt. Col. John J. McCormick, Medical Corps, M. C., U. S. Army, has been detailed to Georgetown and will be in charge of this course.

New Members of Graduate Faculty at Pennsylvania

In the Graduate School of Medicine of the University of Pennsylvania, Philadelphia, four new members are said to have joined the faculty. They are Dr. Donald Guthrie, Sayre, associate professor of surgery; Dr. Francis F. Borzell, assistant professor of radiology; Dr. Jacob H. Vastine, assistant professor of radiology, and Charles Weyl, M.S. assistant professor of radiologic physics.